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the

Journal

*of the association for physical
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MAY-JUNE, 1959

VOL. 13 NO. 3

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THE JOURNAL OF THE ASSOCIATION FOR PHYSICAL AND MENTAL REHABILITATION

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MANUSCRIPT: Manuscripts should not exceed ten (10) typewritten pages; approximately 5,000 words. Manuscripts must be the original copy, not a carbon, typed double-spaced with margins of one (1) inch for large type and one and a half (1½) inches for the small.

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Association of Medical Rehabilitation Directors and Coordinators

July 4 - 10, 1959

The Deauville Hotel, Miami Beach, Fla.

CONFERENCE THEME: "The Geriatric Challenge"

SATURDAY — July 4

9:00-12:00—Executive Board Meeting, AMRDC.
10:00-11:00—Executive Board Meeting, APMR.
11:00-12:00—Representative Assembly, APMR.
1:30- 4:30—Board of Governors, APMR.
2:00- 6:00—Executive Council, AART.
4:30- 6:00—Board of Governors, APMR.
8:00-10:00—Executive Council, AART.

SUNDAY — July 5

8:30-10:30—Executive Board, AMRDC.
9:00-12:00—Board of Governors, APMR.
1:30- 6:00—Board of Governors, APMR.
2:00- 6:00—House of Delegates, AART.
8:00-10:00—House of Delegates, AART.

MONDAY — July 6

8:00-12:00—Business Meeting, AMRDC.
9:00-12:00—Board of Governors, APMR.
9:00-12:00—House of Delegates, AART.
2:00- 5:00—Board of Governors, APMR.
2:00- 5:00—Policy Board Meeting, AART.
2:00- 5:00—Fiscal Board Meeting, AART.
2:00- 5:00—Special Committee Meeting, AART.
7:30-10:00—Southeastern Chapter Meeting, APMR.

TUESDAY — July 7

8:00-12:00—Business Meeting, AMRDC.
9:00-12:00—Manual Arts Sectional Meeting.
9:00-10:00—Registry Meeting, AART.
10:00-12:00—General Assembly, AART.
12:00- 1:00—Luncheon Meeting, Medical Advisory Board and Executive Board, AMRDC.
1:00- 2:00—Exhibits.
2:00- 3:00—Opening of Conference.
Call to Order—Phil R. Davis, RRC, Convention Chairman.
Invocation—Chaplain James A. Boston, V.A. Hospital, Coral Gables, Fla.
Welcome—Hon. William Towell, Mayor, Miami Beach.
Robert Keiser, M.D., President, Dade County Medical Society.
Earl C. Gluckman, M.D., Manager, V.A. Hospital, Coral Gables, Fla.
Response—Willis P. Denny, CCT, President, APMR.
William W. Russell, RRC, President, AMRDC.
Henry H. Meyers, RRC, President, AART.
Introduction of Keynote Speaker—Folke Becker, M.D., Program Chairman.
Keynote Address—*The Geriatric Challenge*—Speaker to be announced.
3:45- 4:15—Coffee Break: Visit Exhibits.
4:15- 4:45—*Physical Medicine and Rehabilitation and the Geriatric Challenge*—S. S. Zintek, M.D., Chief, PM&R Service, V.A. Hospital, Augusta, Ga.
8:00-11:00—General Assembly, APMR.

WEDNESDAY — July 8

8:30- 9:15—Exhibits.
9:15—General Session; Chairman, Joseph H. MacQueen, AART.
9:30-10:15—*Role of the Ancillary Therapies in the Rehabilitation of the Senior Citizen*—Nila K. Covalt, M.D., Medical Director, Kirkpatrick Memorial Institute of Physical Medicine and Rehabilitation, Winter Park, Fla.
10:15-10:45—Coffee Break: Visit Exhibits.
10:45-12:00—*Psychological Problems of the Aging*—Eugene Byrd, Ph.D., Director of Research, Institute of Gerontology, Univ. of Miami School of Medicine.
12:00- 2:00—Lunch.
2:00—General Session—Chairman Earl C. Gluckman, M. D.
2:00- 2:45—*Geriatrics: Potential Unlimited* — A. B. C. Knudson, M.D., Director, Physical Medicine and Rehabilitation Service, V.A. Central Office, Washington, D. C.
2:45- 3:15—*Rehabilitation of the Hemiplegic Patient* — James W. Gibson, M.D., Chief, PM&R Service, V.A. Hospital, Coral Gables, Fla.
3:15- 3:45—Coffee Break: Visit Exhibits.
3:45- 4:15—*Psychiatric Considerations in the Aged Patient* — Maurice Dunn, M.D., Director, Professional Services, V.A. Hospital, Augusta, Ga.
4:15- 4:45—*Rehabilitation of the Arthritic Patient*—Harvey E. Brown, M.D., Dept. of Rheumatology, Univ. of Miami School of Medicine.

THURSDAY — JULY 9

9:00—General Session; Chairman, John E. Davis, Sc.D., APMR.
9:00- 9:30—*Lower Extremity Bracing*—Sterling Huntington, M.D., Senior PM&R Resident, V.A. Hospital, Coral Gables, Fla.
9:30-10:00—*Corrective Therapy for the Aging*—J. H. Van Schoick, Chief, Corrective Therapy, V.A. Central Office, Washington, D. C.
10:00-10:15—*A Tribute to the Memory of Alan Gregg, M.D.* — John E. Davis, Sc.D., Rehoboth Beach, Del.
10:15-10:45—Coffee Break: Visit Exhibits.
10:45-11:15—*Proper Body Mechanics and Patient Self-Care* — Richard G. Fowler, CCT, Chief, Corrective Therapy, Wadsworth V.A. Hospital, Los Angeles, Calif.
11:15-12:00—*New Developments and Techniques in Teaching Driving to the Severely Disabled*—Alfred Ebel, M.D., Leo Berner, CCT, Hy Wettstein, CCT, Louis Braun, CCT, PM&R Service, V.A. Hospital, Bronx, N. Y.
12:00- 2:00—Lunch: Visit Exhibits.
2:00—General Session; Chairman, A. B. C. Knudsen, M.D.
2:00- 2:30—*Medical Hypnosis in Rehabilitation* — Folke Becker, M.D., Chief, PM&R Service, V.A. Hospital, Dublin, Ga.

2:30- 3:00—*The University of Miami School of Medicine, Past, Present and Future*—Homer Marsh, M.D., Dean, Univ. of Miami School of Medicine.

3:00- 3:30—Coffee Break: Visit Exhibits.

3:30- 4:00—*Post-Operative Thoracic Rehabilitation*—Mark Walcott, M.D., Chief, Thoracic Surgery, V.A. Hospital, Coral Gables, Fla.

4:00- 4:30—*Rehabilitation Measures in Orthopedic Surgery*—Thomas E. Robertson, M.D., Chief, Orthopedic Surgery, V.A. Hospital, Coral Gables, Fla.

6:00- 7:00—Reception; Joint Sponsorship APMR, AART and AMRDC.

7:00-10:00—Banquet.

Toastmaster—John G. Hood, M.D., Southeastern Area Medical Director, Veterans Administration, Atlanta, Ga.

Address—*Utilizing the Services of the Handicapped in Industry*—Roy A. MacKenzie, Manufacturing Manager, Lockheed Aircraft Corp., Georgia Div., Atlanta.

9:30-10:00—*The Psychiatrist and FM&R Coordinator Work Together*—James W. Gibson, M.D., Chief, PM & R Service, V.A. Hospital, Coral Gables, Fla.

10:00-10:30—*The Manager Looks at the FM&R Service*—Earl C. Gluckman, M.D., Manager, V.A. Hospital, Coral Gables, Fla.

10:30-11:00—Coffee Break.

11:00-12:00—Panel: *Rehabilitation and the Community*; Moderator—A. B. C. Knudsen, M.D.

Vocational Rehabilitation in the Community—Clarke Ketzle, District Supervisor, Div. of Vocational Rehabilitation, Miami, Fla.

The Crippled Childrens Society Works for Rehabilitation in the Community—Mrs. Egele Kerrigan, Executive Director, Crippled Children's Society, Miami, Fla.

The Counseling Psychologist Works for Rehabilitation in the Community—Charles A. Stenger, Ph.D., Chief, Clinical Psychology, V.A. Hospital, Coral Gables, Fla.

The Social Worker Works For Rehabilitation in the Community—John Hodgins, Medical Social Worker, Protestant Service Bureau, Miami, Fla., V.A. Hospital, Coral Gables, Fla.

12:00- 1:00—Lunch.

1:30- 2:30—Final General Session: Discussion of 1960 Meeting in Santa Monica, Calif.

FRIDAY — July 10

8:30- 9:30—Final Business Sessions.

9:30—General Session; Chairman, John G. Hood, M.D., AMRDC.

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ART THERAPY EXHIBITED

One of the most unusual collections of paintings in the nation soon will be hung in the national headquarters of the American Psychiatric Association in Washington, D.C. Entirely the work of psychiatric patients in art therapy clinics of Veterans Administration hospitals, the 24 paintings were chosen by James McLaughlin, curator of the Phillips Gallery in Washington. Most are of outstanding quality as art, he said.

To the psychiatrist, each tells a story of the man or woman who painted it, but little of this reflection of emotional turmoil or progress toward recovery is apparent to others.

Mostly oils and watercolors, the paintings range in subject matter from a portrait of President Eisenhower to still life of flowers and fruit, outdoor scenes, and abstractions. Painting is used as an aid in treatment of mental patients at many VA hospitals, as it gives them a simple means of self-expression with consequent release from built-up tensions.

VA ISSUES REPORT ON CYCLOSERINE

Test of the newer drug, cycloserine, as a companion drug to isoniazid in treatment of tuberculosis, indicates cycloserine is about as effective as PAS, a drug already in use for this purpose, the Veterans Administration has reported. The finding is based on a study of 732 VA tuberculosis patients with lung cavities.

Although the effectiveness of administration of a combination of cycloserine and isoniazid against the disease was not significantly less than that of a combination of PAS and isoniazid, except in patients with extensive destruction of the lungs, the TB microbes tended to build up drug resistance to isoniazid more quickly in patients receiving cycloserine.

Participating in the project were the VA hospitals at Baltimore, Indianapolis, Iowa City, Livermore, Calif., Madison, Wis., Memphis, Tenn., San Fernando, Calif., Sunmount, N.Y., and Tucson, Ariz.

The study was part of a continuing series of VA-Armed Forces cooperative studies of the chemotherapy of tuberculosis, begun in 1946.

RELATIONSHIPS IN DEVELOPMENTAL AND REMEDIAL PHYSICAL EDUCATION AND CORRECTIVE THERAPY*

H. HARRISON CLARKE, Ph.D.**

At the outset of this paper, a brief clarification of terminology will be made. The purpose of the paper is to present the relationships in developmental and remedial physical education and corrective therapy. Many terms have been used to designate the so-called "corrective exercise" function in physical education. Applied early in educational institutions, medical gymnastics and corrective physical education had common usage. As the field expanded, especially during and after World War I, other designations were adopted by various organizations, especially: physical reconditioning, by the Armed Forces; corrective therapy, by the Veterans Administration; exercise therapy, by the United States Civil Service Commission. In this report, developmental and remedial physical education will identify this service as practiced in schools and colleges; corrective therapy will be used to identify the service in hospitals and rehabilitation centers.

Common Origins

Formal exercise for therapeutic and fitness benefits is part of recorded history, extending from the time of primitive man to the present. The application of exercise to develop the body and to alleviate, improve, and correct certain types of physical defects and neuropsychiatric disturbances was apparent long before physical education *per se* was recognized. Records and drawings have been found showing the use of crude corrective gymnastics by the Chinese about 3000 B.C. There is evidence of the use of exercise, massage, and baths by the early Egyptians, Hindus, Greeks, and Romans.

Following the decline of Athens, physical education went into an eclipse lasting for many centuries. Limited largely to the training of warriors by the Roman Empire and subjected to the devastating con-

cept of the honored spirit and denounced body of the Middle Ages and the classical influence of the Renaissance, physical education did not again achieve cultural significance until the Reformation of the sixteenth and seventeenth centuries.

During this later period, many fundamental developments related to the formal recognition of physical education took place. English and European philosophers, such as Locke and Rousseau, presented the need for physical training in education. Historians and students of ancient art kept alive the knowledge of Greek gymnastics. Largely associated with military preparedness, formal systems of physical education were developed in Germany and Sweden. Exercises for corrective purposes became a definite phase of the physical education process. From this era, the consideration of the child as an entity in education, the utilization of physical education activities to improve mental, social, and physical processes, and the recognition of the therapeutic values of physical activity are of special import in understanding and appreciating the growth of developmental and remedial physical education in this country.

Initially, the German system of gymnastics had the most energetic promotion and greatest acceptance in this country. While Swedish medical gymnastics were utilized earlier in America, it was not until around 1890 that the claims for this system were brought forward with sufficient clearness and cogency as to attract general attention. Growing out of the Ling exercise system, specialized programs, facilities, and personnel were utilized to correct postural defects, alleviate various organic conditions, and develop weak musculatures. Special courses in "correctives" were included in teacher-training courses of study. Many special exercise devices and testing instruments were invented. Activity programs were designed to meet the needs of individuals after examinations and tests had revealed those needs. With few exceptions, the physical education leaders of the period between the Civil War and World War I were trained in medicine; they were attracted to this field because of the potential health values of proper physical activity, a form of preventive medicine.

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The tragic lessons of World War I, when a large proportion of our youth were found physically unfit to defend the nation against a powerful enemy, resulted in a tremendous expansion of physical education in educational institutions. In 1948, all but eight states had statutes requiring physical education in their schools. Such a growth, as would be expected, resulted in many changes affecting American physical education, including the following: The influence of medical leadership in physical education waned, being replaced by that of men and women holding Doctor of Philosophy and Doctor of Education degrees. A consistent effort was made to align physical education with total school purposes. As a consequence, although variously stated, physical education recognized three broad objectives; physical fitness, social efficiency, and recreational competency. In practice, however, physical education generally abandoned its biological heritage; too frequently, the improvement of physical fitness became a concomitant of an activity program designed to realize other educational objectives. Largely, the individual needs of boys and girls were not considered during this period despite the existence of a dynamic educational philosophy to support and quantities of physiological and psychological evidence to justify this practice. Despite these criticisms, it must be stated that a number of realistic physical educators continued an active effort to meet the physical, psychological, emotional, and social needs of individual boys and girls.

New therapeutic applications of exercise were developed between the wars, not only in physical education, but in medicine. Emerging from World War I were two technical specialties in medicine, occupational therapy and physical therapy. Gradually, too, a new medical specialty evolved, which eventually became recognized as physical medicine. The full realization of this field came to dramatic fruition in World War II. With the advent of World War II great vistas opened for the developmental and remedial applications of physical education. Nearly every activity known to physical education was utilized for some phase of hospital and convalescent care. As corrective therapy, many of the activities of physical education are utilized extensively and effectively in the treatment of patients in Veterans Administration hospitals. In fact, the application of physical and motor activities in therapy reached a new all-time high in these hospitals, especially in the treatment of severely handicapped and chronically ill patients.

In general, school and college physical educators have been slow in responding to the new developments affecting their field in convalescent services and rehabilitation. For the first seventeen states studied

in a national co-operative survey, Bookwalter (1) reported that only 4 percent of the high schools included "corrective" work in their physical education programs. In Pennsylvania, Gross (4) found a more favorable situation with 26 percent of the schools maintaining a program of this kind. The colleges and universities do much better, as shown in a 1941 survey by Robertson (5), with the following prevalence of such programs: 87 percent, enrollments 5000 and over; 59 percent, enrollments between 2000 and 5000; 38 percent, enrollments under 2000.

Applications to Medicine and Education

Since World War II, physicians have broadened their concept of what constitutes complete medical practice. There is a growing realization that the diagnosis of disease and the application of curative measures during the definitive phase of illness are not enough. Rusk (6) states that the practice of rehabilitation "begins with the basic philosophy that the doctor's responsibility does not end when the acute illness is ended or operation completed; it ends only when the patient is retrained to work and work with what is left." This development has led to broadening the Council on Physical Medicine to the Council on Physical Medicine and Rehabilitation and the creation of the American Board of Physical Medicine and Rehabilitation of the American Medical Association.

The consequences of the development of this "third phase of medicine" have been the recognition of a need for new technical services and the expansion of the older services in physical medicine. Established ways of doing things are being reconsidered; new services and personnel are being evaluated. The activities of physical education are proving vital to this process. And, this is not the first time it has happened. After World War I, physical education became the parent body of physical therapy; it still contributes many physical educators for specialized training in this field.

The situation for developmental and remedial physical education in schools and colleges differs from that in hospitals and convalescent centers. A contrast of these two types of situations is as follows:

1. As the school is obviously not a hospital, exercise and physical activity are not needed for bed patients. However, infirmary care in colleges may have significance for developmental and remedial physical education.
2. Furthermore, as is true in hospitals, the care of ambulatory patients is not a problem. Advanced convalescent care, however, is appropriate for students returning to the vigorous activities of the regular physical education program following illnesses, accidents, and operations.

3. Contrasted with the large number of chronic disabilities of all kinds in Veterans Administration hospitals, the number of severely disabled in any one school or college is relatively small. The larger the institution of course, the larger this number. Also, many handicapped individuals in this age range do not attend regular schools and colleges. The need for those who do attend, however, is very great. Developmental and remedial physical education can provide vital services for these individuals.
4. In schools and colleges, physical educators, rather than medical personnel, have primary responsibility for developmental and remedial physical education. As practiced in educational institutions, most of the activities of this service are educational and conditioning in nature and do not require medical supervision. There are times, however, when consultation with the school and/or family physician may be essential in dealing with individual cases.
5. Traditionally, developmental and remedial physical education has been concerned with the improvement of postural defects and in the physical development and conditioning of individual students. While posture correction is also recognized as a proper function of comparable programs in hospitals and convalescent centers, the emphasis is usually not nearly as great. Also, special techniques, procedures, and testing instruments have been devised and are used by physical educators to identify and improve sub-strength and other low fitness individuals. In general, this process is little understood or practiced by corrective therapists.

Functions of Developmental and Remedial Physical Education

In the efforts of physical educators to plan programs that will be completely effective in realizing educational objectives, the necessity of meeting individual needs of boys and girls becomes readily apparent. They differ in innumerable ways. For example: their muscular strength varies from weak and puny to physically powerful; their ability to learn skills ranges from neuromuscularly inept to well-coordinated and highly skilled; their nutritional status differs widely between undernourished and obese states; their somatotypes are of many variations; some individuals have serious handicaps of various kinds while others are free from all defects; the differences in social adjustment and mental health are obvious to any astute observer. Program adaptations for such factors should be provided if physical education is to be fully effective in the lives of all boys and girls.

As a consequence of these realizations, developmental and remedial processes have been devised — not as separate entities, but evolving from this complex situation. Simply stated, *the purpose of developmental and remedial physical education is to meet, through physical education methods and activities, the individual needs of boys and girls who are handicapped in some respect, who have functional defects or deficiencies amenable to improvement through exercise, or who possess other inadequacies which interfere with their successful participation in the diversified and vigorous activities of the general physical education program.*

Based on these considerations, then, the specific functions of the developmental and remedial program in school and college physical education might well include the following:

1. General developmental and conditioning activities for individuals free of handicaps but of low physical fitness status. Many individuals in any school or college population, who are organically and structurally sound and who are well nourished, are still deficient in basic strength and endurance elements. These individuals should be identified by tests and examinations, studied for causes of their low fitness status, and provided with individual programs to eliminate causes and improve their general fitness. Mild, progressing to vigorous, exercise regimes should be provided for boys and girls returning to school after devitalizing illnesses and operations before permitting them to participate in the strenuous activities of the general physical education program.
2. Body mechanics training for individuals with non-pathological conditions. The extent of the need for posture training, proper use of the feet, and body mechanics teaching is widespread. Fundamentally, posture work should be included in childhood education, as it is during the formative years of the child's life that proper attitudes and habits can best be developed. Also, during this period, the detection and correction of slight deviations from normal may be more effective in preventing them from progressing into structural deformities. Functional postural defects and weakened foot conditions, however, should be treated at any school level where found.
3. Adaptation of physical education and recreation activities for the handicapped. Basically, physical education in schools and colleges should strive to accomplish the following with handicapped individuals: to develop strength, stamina, and skill within the limits of individuals disabilities; to provide and adapt sports and recreational activities for use during leisure time in accordance with indi-

vidual capabilities; to aid these students to accept their disabilities and to motivate them to live most effectively with what they have to live with.

4. Psychological and social adjustments of "normal" individuals with atypical tendencies. In developmental and remedial physical education, it is imperative to recognize the psychological and social deviates. The program itself should provide activities in which individuals can participate together, and in which they are afforded opportunities for expression in order to help diminish physical and emotional tensions; and should provide physical activities designed to improve the psychological and social condition of maladjusted boys and girls. This program should also develop, create, or recreate a positive mental attitude toward the use of activities as a means for further total growth and development of the individual.
5. Relaxation activities for individuals suffering from chronic fatigue and neuromuscular hypertension. Chronic fatigue and neuromuscular hypertension are closely associated, as in true fatigue there is a definite increase of tension in the neuromuscular system. This tension is reflected in the tenseness of the skeletal muscles. Rest and specially devised relaxation activities are needed to counteract and alleviate this condition. Rest and relaxation may also be desirable for many low fitness individuals at the start of and at different times during their developmental and conditioning program. Frequently, too, boys and girls with extremely high relative strength scores (i.e., relative to their age and weight) may be hypertensed and in need of relaxation treatment.
6. Selected procedures for improving the motor techniques of awkward individuals. Unskilled individuals, for whatever reason, usually have unsatisfactory and frustrating experiences in the general physical education program. They cannot hold their own with other members of the class. In games, the ball is thrown to them only in case of emergency — when there is no other player to whom it may be thrown. In this situation, little or no benefit is realized by the participant; in fact, personality damage may result from lack of status with the group. Boys and girls without adequate sport skills have definite individual needs which may be met through developmental and remedial physical education.
7. Counseling, guidance, and assistance with physical fitness, personal adjustment, and social problems. Permeating the developmental and remedial physical education program is the need for counseling, guidance, and assistance for individuals with physi-

cal fitness, personal adjustment, and other problems; the handicapped must understand the nature of and be motivated to accept his disability; the socially maladjusted may need guidance toward desirable inter-personal and democratic relationships.

Professional Preparation

Very obviously, the amount and nature of developmental and remedial physical education attempted in any school or college must depend upon the qualifications of the physical educators involved. The basic training of these individuals should be the four-year major in physical education. Inasmuch as undergraduate programs in this field vary considerably within the several hundred colleges and universities throughout the country, however, an institution offering a strong sequence of studies should be selected by the prospective teacher for this challenging work.

The well-trained physical educator must have a thorough grounding in foundation sciences, must understand the learning process and the effective application of his activities to the education and development of the individual, must have great versatility in teaching many activities in a physical education program, and must be able to administer, supervise, and evaluate a varied program of physical education and athletics. That it is difficult to achieve the objective of preparing physical educators adequately within the limits of a four-year college program and still provide a liberal-cultural education is very obvious to those so engaged. As a consequence, specialization in developmental and remedial physical education is not feasible in the four-year program under these circumstances. To be sure, the four-year student should have basic courses in this area, including anatomy, kinesiology, physiology, physiology of exercise, psychology, correctives, and measurement and evaluation (2).

Physical educators who wish to become fully qualified to carry out corrective therapy functions in hospitals and rehabilitation centers or to become such a specialist in schools and colleges should have postgraduate study at institutions providing specialized programs in this field. The trained physical educator should take courses in anatomy, kinesiology, physiology, and psychology beyond what he had as an undergraduate and must know their relationships to pathological conditions. He needs to understand the pathology of the various disabilities and deficiencies he will encounter and the utilization of physical activity in surgical, orthopedic, neurologic, and psychiatric conditions. He must be thoroughly acquainted with the modalities of exercise, adapted sports,

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THE ROLE OF THE CORRECTIVE THERAPIST IN THE HOSPITAL*

EVERILL W. FOWLKS, M.D.**

I should like to bring to your attention the fact that corrective therapy is a comparatively new field since World War II in medical education as well as in medical treatment. As physicians, we are prone to think of this therapy as a treatment of patients. However, you will find that there are many of us in the field of medicine who are also educators, and Dr. Jones and I are here because we have both been dealing in education as well as medicine for many years. In fact I was in the field of education before I started in the area of medicine, and so, consequently, I want to impress upon you the fact that in the field of corrective therapy it is not only the techniques and tools with which the therapists work in the field of physical education, in remedial exercise, or whatever you want to call it. They must also have a psychology (the kindness technique), so that they will understand the working of these disabled individuals, and that, whether assisting either the physically or mentally ill, accomplishment is always *prescribed* accomplishment. The physician will give the prescription to the therapist for him or her to carry out certain remedial exercises for rehabilitation of these individuals as useful citizens.

We want to remember that corrective therapy has a large scope. At one time some people thought of it as an infringement upon physical therapy, but I want to inform you, as a man who has been in this field for a good many years, that it is not an infringement, that the goals and aims are the same and that they are a team working together. The physical therapist carries the individual through a period in which he is very handicapped in his illness, and the diseased or injured parts are taken care of up to the point where they can be helped by more exercise. But at the same time those parts which are not injured must not be neglected, and, therefore, corrective therapy works hand in hand with the physical therapy. Originally, after World War I and somewhat during World War II, the one responsible for hospital programs designated that the physical therapists must take care of the injured part, and the physical edu-

cationists (known as corrective therapists in the Veterans Administration, or in other sections as remedial gymnasts) must take care of the non-injured part, but such a division is ridiculous. There is no such thing as separating an individual into injured and non-injured parts. We must all take care of the whole individual. In considering the individual we mean an individual who is a whole personality; one who has a whole mental thinking process going on. If you try to separate him into parts you are going to rule out the philosophy of good treatment. So as physical educators, let me impress upon you—even those in the schools—the need of working and caring for the individual as a whole through the therapies, considering each as having a position on the team, and planning your program accordingly.

I have criticized, very severely at times, physical educators in our school district. Having had a "patient" which I was interested in, physical education, and which I carried over in my years as a member of the school board, I would criticize in the same manner just brought out here by Dr. Clarke. Too often an individual returning to school after an illness or operation has tried to participate in a program which is really set up for the well individual only. Let us not overlook that this individual is a whole individual at all times, and work with him accordingly.

Now, what would be the treatment program for such a person as just mentioned if you were in this field of corrective therapy? I assure you that it would probably be a larger program than one you ever thought of before in a school situation. In the first place you would use conditioning exercises to prevent the deconditioning of the body. We know if an individual, a normal individual, is put to bed for a period of 48 hours, that he loses muscle strength, and that his heart output reduces considerably within that time. As a matter of fact it can reduce as much as 40 per cent, so, consequently, you have to condition this individual at all times. But when you are conditioning him, remember that he has had trauma to his personality. He may be out of touch with reality, and for this reason you have to consider that the patient has a certain amount of anxiety, or that he has a certain amount of psychiatric disability in his illness. Since such treatment is necessary for the general patient it may be understood that corrective

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therapy is necessary in other than the mental hospital alone. There are psychiatric objectives to be carried out in every situation in all hospitals.

And furthermore, what else do you have to do in corrective therapy? You have to be a teacher, in order to teach this individual to go back to what he could do before he lost a leg, or an arm, or became otherwise disabled. I want to impress upon you the importance of this functional ambulation training, for techniques of that sort fall directly in your field, the field which we call corrective therapy. The physical therapist is trained along the same lines, but the physical therapist cannot do everything. In the first place there are not a sufficient number of such therapists, and in the second place the world is too broad, progress must be made, so hand in hand the physical therapist must work with the corrective therapist.

In referring to the teaching of these techniques of ambulation there is more involved than treating the individual as though he were a weakened muscle. There is the technique of teaching the patient how to use a substitute for a muscle, such as a prosthesis, an artificial leg, an artificial limb, or even braces which are a prosthesis. Again we have to look upon this individual as a whole. Is he going back to his occupation as before, or do we have to train him in some new occupation? Do we even have to train him in the self-care activities that are necessary? For example, we will find an individual who has had a stroke, who maybe cannot be rehabilitated to the point of ambulation or in the use of the paralyzed extremities again. We must help him make the best of what is left; that is self-care activity. He must be taught how, as a paralyzed individual, he can feed himself again, and how to help otherwise, such as getting in and out of bed, in and out of a wheelchair, onto the floor and back again, and with the help of a speech therapist how to talk once more. This is all in the field of adaptive education.

Another thing that is important in this field is that, after the physician has given the prescription, these techniques should be administered by the therapists who are especially trained for this phase. Here, unfortunately, I am going to have to make a confession. There are many physicians who do not know how to prescribe these treatments. A physiatrist in the field of physical medicine and rehabilitation does have this knowledge, for he has studied this phase very thoroughly. Others who have this preparation to a certain extent are the orthopedist and the neurologist, but the general physician has not been so fortunate. As you say, Dr. Clarke, just as there is need for more teaching in the field of physical education in colleges, so, also, is there need for further preparation of physicians in medical schools. Unfor-

tunately it is probable that eventually we shall find the need for a still more extended program for training physicians, and, goodness knows there are now six to eight years beyond the pre-medical level!

Another important point to remember is that corrective therapy can be carried on in any institution. It does not have to be in the Veterans Administration alone, nor just in a rehabilitation center, but it can be included in all situations: psychiatric institutions, the rehabilitation center, in the tuberculosis hospital where it has taken years to put across the development of this program. I can remember, not too far back, when it was said that no corrective therapy will go into a tuberculosis hospital because it is not possible to exercise a tuberculosis patient without his breaking down again. We have found in the last fifteen years that the tuberculosis patient under present chemotherapy must be up and ambulated, must be exercised if he is going to leave that institution in the improved physical condition which we desire for him on separation. So now we do have the corrective therapists working in the tuberculosis hospital. He is doing an excellent job there for us.

For these reasons corrective therapy is a field that is growing all the time. Unfortunately we do not have enough people trained for it. Some institutions are not able to offer a sufficient amount of money so that they may say to the individual in the field of physical education, "Go on and take another year or two." The student wants to know, if he takes extra education, "What is it going to pay me from a monetary standpoint?" But let me assure you of this, that we, who are in the field of physical medicine, no matter in what part of the field it is, did not enter this profession merely for financial satisfaction. It is my advice that if any student who talks to you has such an ulterior goal in view, you should discourage him. A person enters this field from the standpoint of what he can do for the individual; how he can help him to return to the life of a useful citizen who may adapt himself socially, physically, and mentally to the situation from which he came before his illness or injury. Before closing let me call to your attention again the fact that corrective therapy, just like all other paramedical services, is a growing thing. Because of the demand for rehabilitation activities it is something that is being needed more and more, not only in the hospitals and clinics, but within the area of education, at the college, high school and even the elementary school level.

The editors of the Journal are indebted to Carl Haven Young, Ed.D., University of California, for arranging for the transcribing and typing of this talk and that of Dr. Jones, which follows.

UTILIZATION OF MEDICAL RESOURCES IN THE PREPARATION OF ADAPTED PHYSICAL EDUCATORS AND CORRECTIVE THERAPISTS*

ARTHUR C. JONES, M.D.**

I am probably the most, what shall I say, the most experienced specialist in physical medicine and rehabilitation in the Northwest because in this region for a good many years, beginning about 1928, I was the only one talking about physical medicine, (later adding the word rehabilitation, which has the same implication to me). For quite a long time I was a "lone wolf" in the Pacific Northwest, and perhaps the only physiatrist, as we now call ourselves, north of San Francisco, and west of Minneapolis. Then Denver came into the scene, and we had some physiatrists there and just very recently the University of Washington has established a department of physical medicine and rehabilitation under the direction of Dr. Lehman. Some of our own residents were in Seattle before this event transpired. We are all very glad to see this impetus to the special interests in medicine to physical medicine and rehabilitation; also this impetus among physical educators in the same area in which we have so many mutual interests.

I thought we would just talk together a little while of this matter of utilizing medical resources in preparation of adaptive and corrective therapists because I feel that medical resources are absolutely essential if one is to work as a therapist and deserve the name therapist. The word therapy comes from the Greek and just means treatment. In the Grecian days, as now, therapy was often administered by people other than physicians. As a matter of fact, a physician was a rather scarce article, and in the Grecian days the surgeon was a very menial individual indeed. He was the slave who cut where the physician indicated with a rod, the physician standing at some distance, pointing at the mark where the cutting was to be done. I imagine that surgery was not at a very high level then, but as time has gone on, things have changed, and the surgeon has become a very respec-

ted individual of great erudition and technical skill. I take my hat off to a good surgeon at any time. The internist or physician, the doctor of physics, has assumed a parallel role, but, shall I say, just a little bit less dramatic than that of the surgeon.

Then we have many other people who are concerned with the healing art, who might be called paramedical people in a variety of areas, and the reason for the development of the nursing service, physical therapist, occupational therapist, and now if you please, corrective therapist (old and yet new). These developments have all taken place because of need. There is real need for the services of people who know something of the human body, and who in effect can extend the hands of the physician, of the surgeon into areas into which he cannot possibly reach. If you can appreciate, first of all, the fact that this is a new and growing interest in medicine that there are a great many doctors, as Dr. Fowlks said, (we all regret the fact but it is a fact) who do not know much about the physics of medicine, nor about physiology as related to exercise. We give them a certain amount of lip service, but actually the details describing the movement are very difficult sorts of things, and require more knowledge of specific muscles and of kinesiology than most physicians of today have. They also involve the application of principles which we do not teach fully in medical schools. We give the job a little side-swipe and let it go at that. I am reminded of an old uncle of mine who would wet his thumb to rub out a mistake which he had made in his pencilled letters. We, likewise, sort of take our thumbs and give it a little swipe and let it go at that.

So, if you understand that there are areas in which you are very well versed, in which the doctor is not so well versed, we just have to come to the conclusion that Will Rogers was right. You know what he said, "Everybody is ignorant, only on different subjects." I quote that occasionally to some of my educated friends, because I think that we all need to take pause and recognize the fact that everybody is ignorant in some areas. If you are up on one thing, you are apt to be down in something else. You folks must realize that the medical profession as a

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whole is not very much up on what you are doing or I am doing, and very apt to be a little bit down on it, and realize also that this is a growing thing, this corrective therapy; it is new, relatively new in medicine. We have remnants of this coming up to us all the time in medicine in our literature, but we doctors, like many other people, tend to lose sight of our background, so this oldest element in the healing arts that goes back to the days of the primitives, is somehow new again, somehow just a little bit suspected yet, but I think we are gaining very much more respect for physical medicine and rehabilitation and all those areas which relate to it through this new emphasis. If we have a few front men who perhaps over-emphasize some points in this area, it is all right. I believe we need people who will stir up folks, medical educators, doctors at large, the public in general, with a lot of emphasis on these things. It is a fine thing. I am very much for it, not mentioning any names.

Let me come down to the matter of utilizing medical resources in the preparation of adaptive or corrective therapists. First, let us look at what a medical prescription properly styled in terms of the specialist in physical medicine includes. You know that all doctors have certain mutual responsibilities, such as writing a big Rx. Do you know what that x means at the end of the R? That x across the R means the sign of Zeus. Give a prayer to the great god, Zeus, to take mercy upon us poor humans and give his blessing to this prescription! The R means recipe; take thou so much of this or that, and take thou of so much exercise is pretty hard to say. It is almost like saying, "Now you take this string and do so and so with it." Whereupon the person addressed will say, "How long is this string?" Sometimes I run up against this same quandry with my patients. I cannot say how long one must exercise; how much he must exercise; how long it is going to take him to achieve a certain result with this exercise. But the doctor, first, in thinking of the Rx, thinks in terms of drugs—take so much of tincture of digitalis, so many drops, so many times a day (you are getting pretty drowsy). Drug therapy, sometimes, even with the erudition of physicians and druggists today, is just a little on the empirical side. We cannot turn our backs on empiricism. If we do we certainly are leaving behind us a very great heritage. I see no reason why we should not be a little empirical at times, but perhaps we had better not be stuffy.

After drugs comes diet, and diet is another item in medical management which is most difficult of proper administration for two reasons; one, because it is hard to determine how many calories of this, that, or the other from carbohydrates, proteins and

fats are necessary for this individual; whether he needs insulin or not and how much. But, in addition, you have to put the patient on his own responsibility, and he is "gosh darn well going to eat what he wants to." Thus you have a selling job everytime you put anyone on a diet. My wife says, "Why don't you get away from the terms diet, or putting people on a diet, because they have a very bad implication. You should just call it 'selective eating'." I think that is a pretty good *bon mot*; call it "selective eating."

After prescribing diet and drugs, we have, also, situational factors to consider. Does this person being cared for, need complete bed rest? Does he need to be jarred out of this rest to sit and dangle on the side of the bed? Dangle, this is a very much abused term, is it not? What do you mean, dangle? You physical educators and corrective therapists will chuckle at this, but the nurse wants to know what the doctor means when he says the patient may dangle. You might hang yourself from the ceiling and be dangling! Therefore we have the matter of early ambulation. How early must ambulation begin, and what does the doctor mean by ambulation? The chances are that different doctors mean very different things by this word ambulation, but without regard to this variation in semantics in respect to this word, early ambulation in its broadest sense, has done a great deal for the public, for the doctors, the nurses, and everyone who administers hospitals, because this early motivation and early movement or mobilization, has resulted in cutting down the post-operative period by a most remarkable percentage in many institutions. That is most desirable from the standpoint of your own economics. It is much better for one not to have wasted his substance, one might say, in lying in a bed.

Formerly we kept people in bed for 14 days after an appendectomy and never considered getting a hysterectomy case out of bed in less than three to four weeks, and a gall bladder about the same. Nowadays we have appendectomy cases up and walking around, at least having bathroom privileges, which is another abstruse term, within the first day or two. Unabsorbable sutures are apt to bring this about, and that is a fine thing, for we do not have as many "bed pan pushers" as we did have in the hospital, now that there is early ambulation. What you are interested in is that the doctor himself must determine how soon this patient may be up, how long he may walk, and how much exertion he may be allowed to take, due to the fact that he has had a hernia repaired or a long abdominal incision made, or that he has just recovered to a certain point from his tuberculous process.

These aforementioned considerations are medical responsibilities that cannot be delegated to the nurse or therapist, and yet you can certainly share in the observation of the patient, and make such remarks as, "Doctor, I think this patient is doing very well," or, "Old Mrs. Smith is not quite so strong as we thought she was and seems pretty feeble. What should we do about it?" Because the therapist must help the doctor to observe one of the most important things that he has to do about movement, namely, to find out what amount of movement this patient is capable of, you are quite entitled as corrective therapist, physical therapist, occupational therapist, or nurse to share in the doctor's observation and make your memoranda on the notes or call it to the doctor's attention. This matter of judgment as to the amount of movement dosage in terms of movement is pretty difficult, I think you will all agree, especially with the more severely disabled people or those who are early in their convalescence from some illness.

Thus the prescription for physical medicine is something which goes way beyond treatment by drugs, or the bed rest of such and such a date, and goes into an area which can be summarized as a whole group of procedural things which are unfamiliar to most doctors, and which, certainly, have not been codified or standardized with physical medicine specialists, and which involve almost any variant from the least little wiggle to the most complete, active, and exhausting activity. As a rule in building a prescription for physical medicine, determination of these factors are the *pay off in medicine* of the prescription. This is why physical medicine is neglected by otherwise very good doctors because it takes more time, more thought, and thought in an area which is unfamiliar, and so it is often passed by. I think that we in medicine sometimes do as other people in other areas, that is, we make a virtue of necessity or a convenience, and say, "Oh skip it." Do you remember when we would read along . . . mumble . . . skip it, then go on with the next word and sort of get the meaning by context? I think we doctors sometimes do that; I do not suppose you do.

In other words, we in physical medicine have to prescribe a series of energies and movements, some of which can be applied passively, and others which require the volition of the person who is making the movement. It is right there where we get into difficulty. But, ordinarily, we will say that it consists of some form of heat and some form of massage, stretch, traction, and passive mobilization. Then going on to a whole gamut of movement, which includes assisted movements, which applies to the patient's time and active movements where you know he is working; re-

sistive movements where you can measure his resistance with some units of weights against time; range of motion through which weights are moved; and then we go into a whole gamut of motion patterns. These are movements with which most of you deal more specifically and along with which goes this motivation.

Speaking of motivation, what is a motive, anyway? Well, it is a sort of feeling inside of you that makes you want to do something, is it not? This motivation must precede and accompany the movement (and if the patient does not want to move, he is not going to move very dynamically, that is certain) so you have to form a rapport with this person. You are thinking, of course, of classes where eager and shining faces are up here doing their calisthenics, perhaps—I hope not. But at any rate if your concept of the person with whom you are dealing includes a poor, weak, old lady who has had a stroke, you realize how important motivation is as it runs throughout the whole range of therapy. It is amazing how many people who really know better, will be passive or even negativistic about movement. Therefore, the motive is a very insidious thing. We may take a variety of approaches in the motivation, and the doctor must be very important in this because he has to tell the patient, "Now, this is important for you to do." I am sorry to say that many doctors are not convinced that this is important to do at all, and do not stress it to the patient. For this reason the patient is already half unsold on your activity as a corrective or physical therapist before you go in there. I think, perhaps, we can do more in this area of persuading the doctor that movement is important because, you know, we are in an era now of transition from the era of rest, complete rest. If you will read Hilton on *Rest and Pain* you will know what I mean. Dean Dillinghouse was a worshipper of Hilton and his work which was originally written in the 1880's, I believe. It is quite outdated because rest has been overemphasized, and movement has not been sufficiently emphasized, and I submit the thought to you ladies and gentlemen that movement and rest are the two sides of the same coin. We are just beginning to wake up to this.

Along with the prescription go some cautions and limitations: First, we have to know about the *diagnosis*, these resting on medical facts of course. The therapist must be aware of these, and must be on guard to determine them even though they have not been written down, because doctors are just as bad about writing things down as educators, if not worse. The doctor may not specify these limitations and warnings and special considerations, or he will

assume that you ought to know better if you do something you shouldn't. At first, then, we have the diagnosis which is fairly basic. It is not necessarily the determinant in the case. Second, we must know the *degree of involvement*, and that is much more important, especially to us in physical medicine. The evaluation goes with the diagnosis always, and sometimes we do not realize it. Third, we must understand the *pathological state*: you might have tuberculosis, and have a spot in one lung, or you might have one lung and part of the other involved, the degree of involvement making all the difference as to what one does about this tuberculosis patient. Of course, that stands to reason in almost any condition you might name. Fourth, the *physical factors* must be taken into account, physical factors as related to the central nervous system and its integrity or loss of it; the sympathetic system, whether it is functioning well or ill; whether there is some upset or vascularity due to sympathetic imbalance; the matter of actual bone, joint and muscle state. The question may arise as to whether this fracture is sufficiently well healed so that the patient may bear weight on it. In this respect you had just better clear to be sure, or at least you share with the doctor in the responsibility of determining whether this bone has sufficient mechanical integrity to stand up under the load. I have seen a femur fracture when you just lifted the leg; for example, we had a paraplegic up at the Center not many years ago who was just leaning forward on the mat in the long-sit, reaching to tie his shoe and he fractured his femur. It is a question whether we were really responsible for this or not. But these states are very important. What is the state of this muscle, is this a trace or poor muscle, and if it is poor, how much may it be moved before you over-fatigue it? Over-fatigue may shut the door to recovery as you well know. Fifth, the *biochemical factors* must be taken into account, and I will not go into that because I am using up too much time. I get verbose when I get such a popular, sympathetic audience. My apologies if I seem verbose, but it seems to me with what I have said, without expanding further on this point, that it is clear that the physician has a variety of responsibilities with respect to the patient, and that any therapist shares with the doctor in varying degree, with the medical doctor in these responsibilities, and that is the crux of a whole lot of things.

So, what are the medical resources which are to be drawn upon in the education of the corrective therapist, or a therapist in any area for that matter? The very word therapy carries with it medical implication, and to say that you are paramedical personnel or that you are co-professional in medicine, I think, is a perfectly reasonable way to describe your

relationship if you are in any area of the healing art. Admittedly there is a very wide area where there is transition, but what are these medical resources? Well, we have *anatomy* to consider. Everyone must know something about anatomy if he is to handle the human form, most specifically the corrective therapist, the physical therapist, and occupational therapist. We have to have *kinesiology* beyond what the average doctor gets. I have never known a therapist yet in any of these fields who did not know a lot more kinesiology than the doctors did. Having taught anatomy for several years, I know that our teaching of kinesiology is most woefully lacking, but it is there to be dug out and it is hard work, as you will admit. You have to have some *chemistry*, and more *physics* than most people get about heat, mechanics, and electronics. You must have some knowledge of *pathology* and with it *bacteriology* and *virology*; some knowledge of a variety of *clinical states and diseases*, such as *internal medicine*, *neurology*, *psychiatry*; *factors about infections*; the *eczematous diseases*, *arthritis* particularly; *fractures* and other *orthopedic conditions*; *vascular diseases*,—oh, there are a gamut of those things.

In addition to this scientific knowledge the corrective therapist needs to know something of the *duties* of the other people in rehabilitation and have orientation to these people, as well as to the doctors and nurses. Then he has to acquire knowledge about *ethics*. I would like to ask if you know what ethics are? To me ethics represent something more than just a schema of action, or some social inhibitions which have been built up in certain tribes, including our tribe. Ethics, to me, mean the data, the facts which we have been able to gather about certain forces in society, and which have a bearing whenever there are two or more people in the same environment.

There are also one or two other little minor points that I might make, and I could run along quite awhile, but Dr. Clarke mentioned the Ling System. I would like to submit that here there is no system. We have had too many systems, and there is no "system of corrective therapy," and no "system of physical education." There is no "system of medicine," even. There are only those facts that bear on the human body—its physiology, its functions, both mental and physical. Hence, the prerequisite for all therapists, I think, must be relative to the realities of medicine and to the other biological facts which underline medicine. We are all *biologists*. I wish we would not forget it so often. We are basically biologists. We deal with life and the stuff with which living matter is made, and so we have to expand physi-

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TREADMILL UTILIZATION IN REHABILITATION

LEWIS A. LEAVITT, M.D.*

JOHN J. ARENA, M. ED.**

During the evaluation and treatment of the neurological, neurosurgical, orthopedic, neuropsychiatric and other types of patients in their rehabilitation programs, we became more aware of many factors influencing elevated ambulatory activities. Some of these factors were psychological motivation, physiological limitations, neuromuscular impediments, and effects of orthotic and prosthetic appliances. Thus, it became apparent that some type of therapeutic equipment other than the parallel bars, graduated ramp, canes, or crutches, was necessary to assist the patient in walking. Evaluation of the commercially available treadmills indicated that these machines were designed for the purpose of maintaining and/or improving the general health of individuals who have "normal" locomotion patterns and have ability to activate the machine by their own motor power or with minimal assistance. The majority of the patients treated in our corrective therapy clinic were unable to utilize such devices since many of them needed manual assistance to move within the parallel bars or in the crutch walker. Therefore, after considering the above factors, an electrically operated treadmill with specific modifications to meet the individual needs of a broad category of patients was designed and developed.

The following factors were found to be important and desirable in this therapeutic tool:

- (1) Electrically operated — to assist the patient in ambulation and, thereby, decrease physiological stress.
- (2) Variable speed — from 50 feet per minute, which is a slow walk, to 220 feet per minute, which is equivalent to double cadence.
- (3) Moving platform — 12-inch conveyor belt which reduces energy requirements for the patient and provides a smooth walking surface.
- (4) Parallel hand rails — to increase stability and security for the disabled patient.
- (5) Padded side boards — as safety factor and to encourage a narrow base gait and prevention of circumduction gait.

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FIG. 1
Treadmill Electrical, Variable Gait Platform in an Elevated Position of 20 Degrees

- (6) Method of increasing angle of walking surface — to decrease plantar flexion contractures and mobilize the ankle for development of "push-off" in the stance phase.
- (7) Clock and/or timing device — for accurate progression of ambulation time, recording purposes, etc.
- (8) Spring assistive attachments — to assist forward motion of the flail lower extremity.
- (9) Easily accessible "on and off" switch — instant cut-off can be initiated by patient or therapist for psychological and safety factors.

The machine shown here (Figs. 1, 2, 3, 4) was designed by the authors and Mr. Loyd Faucher, manual arts therapist. It was constructed in the manual arts therapy clinic by patients undergoing prevocational evaluation for post discharge planning (2).

Prior to the utilization of this therapeutic treadmill, it is important that the patient's physical condition be closely evaluated by the physician in regard to the physiological demands created by the activity,

in order that the latter do not cause stress beyond the limitation of the patient's tolerance. For example, neuromuscular components that are involved should not be brought into a fatigue level as irreversible changes sometimes can occur. During treatment in corrective therapy, the therapist checks the pulse and respiratory rate before, during, and after the initial evaluation and on subsequent treatment sessions.

In the following paragraphs, we will point out some of the advantages of the treadmill as utilized by a varied category of patients, including the lower extremity amputee in prosthetic training, the hemiplegic patient in establishing a repetitious walking pattern, and the unmotivated psychiatric patient in



FIG. 2

Treadmill, Electrical, in Level Position with Above-Knee Amputee in Gait Training

mobilizing and establishing desirable gait patterns.

In pre-prosthetic and prosthetic amputee training, the patient can be closely observed as he ambulates on the therapeutic treadmill. As deviations from the normal gait pattern are detected, the cause can be investigated, necessary prosthetic changes can be made and establishment of correct gait pattern set forth, resulting in definite improvement of the amputee's ambulatory pattern and in more efficient utilization of the prosthesis (1). In order to maintain a uniform step pattern, the stride is measured with the sound limb and the instructor draws a series of chalk lines across the moving surface of equal distance to the initial step. The amputee then utilizes these suc-

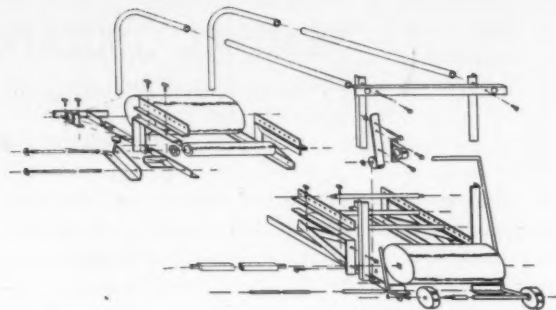


FIG. 3

Schematic Drawing Showing Fabrication of Treadmill

ceeding lines as a guide to practice alternate stepping with the sound extremity and the prosthetic limb. Also, the narrow walking platform (12 inches) and the padded side boards allow the amputee to practice a narrow base gait since the side boards discourage circumduction of the extremity and are a continual reminder to develop a normal swing stance phase. Another technique used to correct the wide base gait pattern is for the instructor to draw a chalk line down the middle of the moving platform. Thus, the amputee utilizes this line as a target for foot placement.

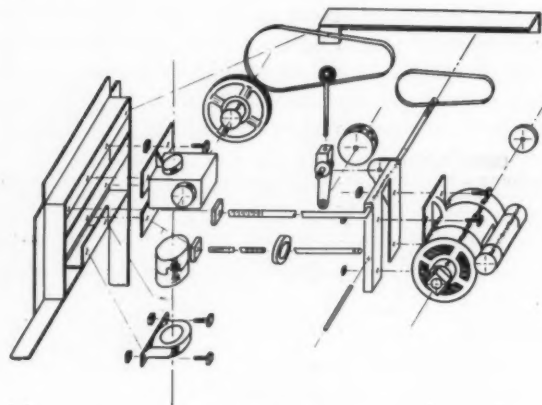


FIG. 4

Schematic Drawing of Motor and Gear Arrangement for Variable Walking Platform

In the treatment of the hemiplegic patient, the treadmill has been found very helpful in establishing a continuous walking pattern and in improving stability and balance. If the patient has a shortened heel cord, the treadmill can be elevated so that the patient can walk at a 15 degree incline. This brings about progressive gradual stretching of the gastrocnemius-soleus musculature with each step and often, within a short time, the plantar flexion contracture can be alleviated.

Hemiplegic patients, who have considerable difficulty in carrying the involved, relatively flail lower extremity through the swing phase, are assisted by attaching one end of a spring or rubber band to the forward post of the treadmill and the other end to a wide cuff and ankle harness. As the patient shifts his weight to the sound extremity in the stance phase, the involved lower extremity (often braced) is carried forward through the swing phase. The use of springs is also beneficial in alleviating adductor spasm which causes "scissoring" of the extremities, especially for those patients wearing bilateral long leg braces who are unable to perform alternate stepping due to interlocking of the medial uprights.

Incoordination and overactivity of the synergistic muscle groups are often noted in the neurological patients and, thus, some patients with good strength will often present an unstable, incoordinated gait which requires a great deal of energy. This condition may be improved by assistive ambulatory activities using the treadmill (2).

Perhaps one of the more interesting utilizations of the treadmill is with the unmotivated patient having psychiatric and/or neurological involvement. A patient may be motivated into walking on this treadmill whereas he will not participate in other activities with subsequent progression into his complete program of rehabilitation. It is often noted that these

patients rarely realize that they are ambulating on the treadmill for relatively long distances that would be seemingly difficult to accomplish in the parallel bars.

In peripheral vascular disease syndromes with arterial insufficiency, the treadmill is useful as a time-saving testing device to objectively measure the distance and/or length of time the individual can walk before the onset of intermittent claudication. Those patients with segmental arterial occlusion of arteries of the lower extremities have a very low walking tolerance on the treadmill and often cannot walk more than 2-2½ minutes at 120 feet per minute before the onset of intermittent claudication. After successful operative procedures, it has been found that some of these patients can walk for 10 minutes at 120 feet per minute with no symptoms of intermittent claudication. Also, before and after sympathectomies, objective comparative studies can be accomplished and are very useful in determining the beneficial results of such surgical procedures.

Summary

The treadmill, as described, has been found to be of value with patients in ambulatory activities, prosthetic training, as well as mobilization and motivation of patients with chronic neurological and/or psychiatric conditions. It is also beneficial in the establishment of objective tests in peripheral vascular disease syndromes.

COMPANIONSHIP PROVIDED BY HOSPITAL VOLUNTEERS

Companionship of volunteers from the community is helping give Veterans Administration medical care for disabled veterans another dimension beyond hospital walls, VA said recently. Dr. Roy A. Wolford, VA deputy chief medical director in Washington, D.C., said companionship services by volunteers for patients discharged from the hospital are enabling many chronically disabled veterans to live at home instead of on VA hospital wards. Combining some of the aspects of social work and of recreation therapy, these followup services are a means of meeting basic needs for love, attention and security, Dr. Wolford said. Neglect of these needs can cause emotional difficulties or aggravate physical illness in disabled and aged persons, he said.

Companionship services are used for veterans with a wide range of physical and emotional disorders, and especially for those who have no relatives or close friends to see to their welfare.

A volunteer at the Phoenix, Ariz., VA hospital, for example, has been visiting former patients who have considerable loss of hearing or sight, who are paralyzed, who have mental deterioration, or who because of various diseases have lost the ability to speak or write.

Volunteers at the Wilkes-Barre, Pa., VA hospital not only visit former patients in their homes but arrange for them to attend meetings of service organizations, church socials, and other community activities in which the veterans have expressed interest.

How these seemingly small services can help a patient or his family enough to prevent his rehospitalization is shown by reports from VA social workers:

A 59-year-old veteran who had suffered a stroke was

admitted to the Fort Howard, Md., VA hospital. He was partially paralyzed and unable to speak, but was alert. His progress in physical medicine and rehabilitation therapy was rapid, and he learned to care for himself and get about in a wheelchair.

When he was able to leave the hospital, his wife was doubtful that his disability would permit him to live at home, but when she was offered the help of volunteers she was enthusiastic about their visits.

One volunteer takes the wife shopping every week, and others encourage the veteran in getting about with aid of a leg brace. The family's home situation has become bright enough for him to remain outside the hospital.

The Fort Howard volunteers also visit disabled veterans regularly in community nursing homes and send birthday and holiday greeting cards to them to brighten the special occasions.

At the Tuskegee, Ala., VA hospital, volunteer companionship services have helped a long-hospitalized patient become adjusted to his home and community. The patient's family, because of work and limited resources, could not offer him the attention needed to minimize his preoccupation with his disabilities. Volunteers arranged for recreation, such as sight-seeing trips and playing checkers, which has enabled him to make a better adjustment.

Dr. Wolford said volunteer companionship services are proving especially valuable for disabled veterans who are alone in the world, for those who become fearful as they grow older and their diseases progress, for those who have lost belief in their own self-worth, and for those who because of their inability to talk are often denied contact with others.

THE RISE, DECLINE, AND REBIRTH OF CORRECTIVE THERAPY*

FOLKE BECKER, M.D.**

Introduction

The indications, contraindications, and effects of therapeutic exercise are better understood today than they have ever been in our medical history, and, are not within the purposes of this paper as regards discussion. This presentation is concerned with the rebirth of exercise therapy as a distinct profession in recent years, largely through the precedent set by the Veterans Administration in its rehabilitation program.

What are we going to do about this "new" profession which is now clamoring at the doors of the American Medical Association for recognition as an ancillary profession along with physical therapy and occupational therapy? What will its future be? There is great negative pressure on the one side from many members of the two recognized therapies in physical medicine and rehabilitation, who foresee a usurpation of their prerogatives in the field of therapeutic exercise, and, on the other side, there is great positive pressure from those in the field of exercise therapy for recognition as a therapy specialty in medicine. The number of physical and occupational therapists favoring the formal recognition of exercise therapists by the American Medical Association has not been ascertained with accuracy.

Discussion

Asclepiades stated that "Diet, masseuring and exercise should keep a body from disease." Sydenham, in the Seventeenth Century, said, "Exercise is the best Medicine for the body, as it excites the flow of spirits and facilitates the flow of excretions from the blood." The history of medical gymnastics, as exercise therapy was formerly and universally called, dates back many hundreds of years before Christ, to the ancient Chinese and Brahmins. As we well know, the practice of therapeutic exercise and massage is a very old calling. In fact, medical gymnastics, which traditionally included manipulations or massage, is a much, much older calling than either physical or occupational therapy as a profession. The latter two have themselves, only relatively recently, achieved recognition by the medical profession as ancillary therapy groups.

Therapeutic exercise is the scientific application of bodily movement to maintain or restore normal

function to diseased or injured tissues. The basic concept of this definition has not changed for centuries. Edgar Cyriax, in 1909, published what is undoubtedly the most complete and authoritative bibliography of medical gymnastics ever written, in which he has listed publications relative to therapeutic exercise dating back more than five centuries! In 1923, Charles John Samuel Thompson published a treatise on "Massage in Antiquity" which made many references to therapeutic exercise in its relation to massage. Until the turn of the century, massage and therapeutic exercise went hand in hand. Indeed, the old and respected Chartered Society of Massage and Medical Gymnasts in England included only those masseurs and masseuses trained in *remedial exercise*! The Incorporated Society of Trained Masseuses of London, for example, was a distinct and separate group. Paralleling the English groups in this country, the New York Medical Gymnastic and Massage Society was formed in 1898. In the Spring of 1899 an advisory board of twelve physicians was secured. Its purpose was to raise the professional standards of medical gymnasts and massage. Allow me to read to you article II of its Constitution:

The object of this Society shall be to advance the science of Medical Gymnastics and Massage, to establish a better general understanding and appreciation of the same as a valuable auxiliary to Medicine and Surgery, and to promote a closer relationship between qualified and reputable practitioners of this profession.

You see, you were engaged in improving ethics even then! Over one hundred years ago, Moritz Shreiber, Director of the Leipzig Orthopedic and Medico-Gymnastic Institute, was having his Third German Edition of Medical Gymnastics translated into English by Henry Skelton of England in an illustrated volume called *Medical Indoor Gymnastics*. Skelton defined medical gymnastics as a term which included both prevention and treatment of disease or infirmity through *prescribed exercise*!

Dr. Charles Fayette Taylor, founder of the New York Orthopedic Dispensary and Hospital, and for many years its Surgeon-in-Chief, was perhaps the first American physician to make a really serious movement toward the use of medical gymnastics as a therapeutic agent. He died in 1899. The period from 1875 to 1900 was perhaps the golden age of medical gymnastics as a profession in America. My father, Carl Eric Gottfrid Becker, who was a graduate of the Liedbeck Gymnastic-Orthopedic Institute in Stockholm before the turn of the century, is an example

*Presented at the Annual Clinical and Scientific Conference, Southeastern Chapter, APMR, Dublin, Ga., May, 1957.

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of what happened to the medical gymnasts of that time on the continent and in America. During the first part of the Twentieth Century, many of the progressive medical gymnasts here and abroad had begun to use the various forms of electricity, light and heat as standard adjuncts in their practice. From these parents, the medical gymnasts, was born a new profession, the physiotherapists or physical therapists as they are now called. With New York and other States paving the way, educational standards and other requirements for licensure became more rigid and standardized until by the mid-twenties they were on a uniformly high level in many States.

We are all familiar with the phenomenal growth of the specialty of physical medicine and rehabilitation within the past thirty years. The ancillary specialties of physical and occupational therapy have advanced in importance and prestige in parallel fashion. This has come about, not through automatic growth but by earnest endeavor, to keep pace with newer and improved techniques and constant effort to maintain the highest standards of service and training. These two therapies can be justly proud of the position of confidence and trust in which the medical profession regards them. Exercise therapy, or corrective therapy as it is generally called, is paradoxically a new profession despite its ancient history, as I have brought out. Corrective therapy has been formally organized as a specialty however, relatively recently and largely within the framework of the U. S. Veterans Administration. Formalization took place in 1946, as described by Dr. A. Ray Dawson, formerly Assistant Medical Director, Physical Medicine and Rehabilitation Service, U. S. Veterans Administration. In 1953, The American Board for Certification of Corrective Therapists was organized, setting forth certain educational requirements for certification which includes the completion of an approved four-year curriculum leading to the baccalaureate degree and including also, courses from specified areas. The completion of a minimum of 250 hours of clinical internship in medically supervised physical education under the sponsorship of a recognized college or university and under the direct supervision of a doctor of medicine and a certified corrective therapist is also required for certification.

Conclusion

Corrective therapists, then, are the modern-day medical gymnasts, as many of them are still called on the Continent. It will be up to corrective therapy, as a profession, whether it will rise or fall again. Great strides forward are being made. Although it

will be necessary for the exercise therapist to possess a comprehensive knowledge of the principles and practice of therapeutic exercise as applies to his function in the medical auxiliary field, it is not to be implied in any way that corrective, or exercise therapy as I prefer to call it, will take over the function of physical or occupational therapy in the field of therapeutic exercise. The latter professions have firmly established functions in the field of therapeutic exercise and intend in no way to relinquish any of these functions, but to strengthen them. In this, they are right. They have the same root origins in history that exercise therapists do. Specific exercise therapy will, in any case, usually augment, overlap, and intertwine with other therapies to the end that the patient is restored to the fullest measure of usefulness possible as regards his job and activities of daily living. This is in keeping with the principle of total rehabilitation and no one discipline in medicine has any monopoly on that. In any case, indications for therapy are the sole responsibility of the qualified physician. In charting your course for the future, it will be essential that you nail down the *need* for your services as a member of the rehabilitation team. This, you have in large measure accomplished, especially within the Veterans Administration. You have shown here that dynamic rehabilitation is often enhanced when the exercise therapist, physical therapist and occupational therapist combine their talents and efforts as outlined in the medical prescription. You are showing continuing zeal in improving your educational qualifications and encouraging research in your field to the end that your contribution to mental and physical rehabilitation be of ever more significance to medicine. A good example to follow would be that set by our beloved Marine Corps. It has an illustrious history that dates back to pre-revolutionary days when we had no formal army or navy. Nonetheless, as it progressed as a corps, it never attempted to do it all and take over the entire defense of this country. It established our need for it by superior performance. Results will tell the story. You have had an illustrious past as medical gymnasts. Your future will depend upon the respect you engender from all the other therapies and the medical profession through our mutual productivity in the interest of the patient.

SOURCES OF HISTORICAL DATA

1. Archives Section, The Library of The New York Academy of Medicine, New York, N. Y.
2. Personal Source Records.

A STUDY OF THE CALCULATED BODY COMPOSITION OF AMATEUR WRESTLERS*

PHILIP J. RASCH, PH. D.

M. BRIGGS HUNT

Keys and Brozek (1953) have stressed both the importance of studies of body build with emphasis on body composition and the difficulties inherent in such investigations. While their review makes it evident that the tools with which we have to work at this time are none too reliable, it is only through experience with them that the knowledge essential for the development of better ones can be gained.

In a previous investigation it was determined that certain standard body indices of members of the 1956 U.S. Olympic Free Style Wrestling Team did not differ appreciably from those of non-wrestlers. As a result of the publication of this data (16), readers raised a number of questions regarding the lean body mass (LBM) of these wrestlers, particularly with regard to whether a wrestler who drastically reduces his weight loses part of his LBM or only adipose tissue. Answers to these inquiries were not immediately forthcoming and are only partially available now.

Review of the Literature

The concept of LBM was introduced by Behnke (2) to denote the "active protoplasmic mass," i.e. the body free of metabolically inert depot fat but with adipose tissue protoplasm. His calculations have received support from Miller and Blythe (11), who have shown that predictions of LBM based upon oxygen consumption or upon creatinine excretion agree very well with the data reported by Behnke. This is one of the newer approaches to the study of body composition, and an examination of recent reviews of the subject (10,4,8) does not indicate that it has been extensively used in investigations of the effects of athletic training. As a matter of fact, Keys and Brozek have commented that they were "not aware of investigations on man utilizing the modern techniques for the study of body composition" (1953).

According to Behnke's theory, it is the amount of adipose tissue and not weight *per se* which is the determinant of the specific gravity of the body. Obviously, the lowest possible specific gravity of the



FIG. 1
Shozo Sasahara, three times world's lightweight free style wrestling champion, twice Olympic champion, conceded outstanding wrestler in the 1956 Olympics, and at present coach of the 1959 Japanese Amateur Wrestling Association team. At right is one of the authors, Philip J. Rasch, Ph.D.

body would be that of fat itself, which is estimated to be about 0.9171 (10). From Behnke's work it would appear that the maximum specific gravity of the LBM is approximately 1.098. In a group of professional football players, the majority of whom were "All-American" selections, a mean specific gravity of 1.080 was observed (3). This may be compared with a specific gravity of 1.0695 at 35-36 degrees Centigrade for the reference standard "normal young man" established at the University of Minnesota Laboratory of Physiological Hygiene (21). On the basis of the standard height-weight tables used by insurance companies and the military service, eleven of the seventeen "All-American" football players who served as subjects for this investigation would be rejected as "overweight," whereas these men were actually "in

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prime physical condition if the absence of excessive fat is a criterion of fitness (5).

The traditional method of obtaining specific gravity has required that the volume of the body be ascertained by comparing the weight of the subject in air with his weight in water, according to the formula:

$$\text{Specific Gravity} = M/W$$

where M equals mass of the body in air and W equals the volume of the water displaced. Details of the actual procedure involved have been described by Behnke, Feen and Welham (1952). As Cowgill (7) has commented, this requires specialized apparatus and techniques quite beyond the capabilities of most of those interested in securing such data. To overcome this difficulty he reworked Behnke's data and developed a formula for the calculation of specific gravity from height and weight. In its most usable form it may be expressed as:

$$\log \text{ Specific Gravity} = 0.8 \frac{(\text{Hcm}^{0.942})}{(\text{Wg}^{0.73})} + 0.162.$$

With the specific gravity thus obtained, the investigator may utilize the Rathbun and Pace (1945) formula to obtain the percent of fat content of the body weight:

$$\text{Per cent Body Fat} = \frac{(5.548)}{\text{Specific Gravity}} - 5.044$$

Keys and Brozek (1953) have recommended use of the formula:

$$\text{Fat (percent body-weight)} = 100 \frac{(4.201 - 3.813)}{\text{DB}}$$

To simplify the calculations, these investigators prepared a table in which the body specific gravity is converted to per cent body fat. LBM is then equal to the measured body weight minus the fat content.

As with all approximations, these methods have been subjected to certain objections. Dupertius *et al* (1951) have shown that individuals of different body types vary enormously in specific gravity. According to their data, those high in endomorphy had a mean specific gravity of 1.047; those high in mesomorphy, a mean specific gravity of 1.078; those high in ectomorphy, a mean specific gravity of 1.079. Accordingly, they suggested that it should be possible to devise a formula which would improve on the prediction of specific gravity and percentage of body fat by the use of the first component of the somatotype. There has been some criticism of the Rathbun-Pace formula on the ground that its figures were obtained

from the study of guinea pigs rather than from humans, and Keys and Brozek (1953) have shown that the Rathbun-Pace table incorporates certain errors resulting from their failure to take the temperature of the body and of the water into consideration. They suggest that it would be preferable to use the density of the body rather than the specific gravity in such computations. The density of the body (DB) represents its mass in the air (MA) divided by its volume (V), or $DB = MA/V$. But since the density of the water is affected by its temperature,

$$V = (MA - MW) DW$$

At 36-37 degrees C, a temperature commonly used in laboratory work, $DW = 0.937$. The specific gravity is the ratio of the density of the body at a specific temperature to the density of the water at a specific temperature. Thus both temperatures must be taken into consideration, which introduces further complications into the calculations and results in errors if they are omitted.

However, Rathbun and Pace appear justified in their basic assumption that there is an over-all uniformity of mammalian tissues with respect to chemical composition (14), and the total error introduced into the calculations by the use of their table does not appear to be excessive. Sen and Banerjee (1958) determined the specific gravity of 16 male and 9 female students by the water immersion method. The mean fat calculated by the Rathbun-Pace formula was 11.0 per cent of the body weight, as compared with 11.3 per cent of the body weight when computed according to the Keys and Brozek formula. Presumably this error is constant and hence should not affect the use of either formula for the comparison of different groups.

Osserman *et al* (1950) have determined the body water of their subjects by the antipyrine technique and derived the following formula for the calculation of the per cent of body water:

$$\text{Per cent Body Water} = 100 \frac{(4.317 - 3.960)}{\text{Sp.gr.}}$$

With the per cent water known the water-free tissue may be determined by subtracting the weight of the water from the body weight, and it has been suggested that for the purpose of comparing basal metabolic rates, a reference standard consisting of total body weight and/or water-free tissue rate would deserve preference (18). Dupertius *et al*. (1951) found a negative correlation between endomorphy and the percentage of body water.

Behnke, Osserman and Welham have stated that "on a restricted diet accompanied by weight loss constancy in the weight of the lean body mass indicates that nitrogen balance is maintained and that the 'lost' tissue is fat" (1), while Thompson has expressed the opinion that "body fatness, particularly subcutaneous fatness, can be altered by strenuous football training" (20). Views that changes in body weight mainly reflect variations in body fat depots, with the lean body mass remaining fairly constant, may be oversimplifications of the problem. Petersen (1958) found that alterations in body weight in the treatment of thyrotoxicosis and obesity were associated with changes in total body water, extracellular fluid volume, body fat content, and lean body mass.

It was the purpose of this paper to compare the body compositions of highly trained amateur wrestlers as calculated by the above formula with each other and with a group of non-wrestler controls. Data were collected on three separate groups of wrestlers: (1) the 1956 United States Olympic Free Style Wrestling team, (2) the 1959 varsity team of the University of California at Los Angeles, and (3) the 1959 Japanese Amateur Wrestling Association team. The control group consisted of unselected students of comparable age from the College of Osteopathic Physicians and Surgeons. Since the assumption underlying the familiar parametric methods of analysis of variance cannot be met under such conditions, the non-parametric Kruskal-Wallis one-way analysis of variance was employed. This tests the null hypothesis that the k (3 or more) samples come from identical populations with respect to differences in the mean ranks and variances. No statistic was accepted as being significant unless the chance occurrence of such a statistic was 5 per cent or less. Since the collected data are too large to be presented here, only the means of each of the four groups are given in Table I. Included in the Japanese group was an individual generally considered to be the world's greatest free style wrestler. Data on this athlete are shown separately. For comparative purposes applicable mean data obtained from normal subjects by Osserman *et al.* (1950) on 81 normal male subjects whose ages were very close to those of the subjects of the present study are also shown.

Since the differences between the four groups of subjects studied were found to be without statistical significance, it was concluded that k samples came from homogeneous populations; that is, that the averages of the groups of wrestlers did not differ from each other or from non-wrestlers in respect to body composition as determined by these formulae. This is consistent with the findings obtained in the earlier study of the body indices of wrestlers (16).

The use of the Cowgill formula for the computation of specific gravity gave results which are consistent with those derived from studies in which the specific gravity was determined by water immersion. It will be noted from Table I that the higher the specific gravity, the lower the per cent of body fat and the higher the per cent of body water. This relationship is identical with that reported by Osserman *et al.* (1950) and others who did not utilize this formula.

At the same time it raises other questions. It is rather generally agreed that athletes have a higher body density than do non-athletes (19,20), and the failure to detect any significant difference between wrestlers and non-wrestlers in the present study is surprising.

This suggests the need for a determination of the validity of the Cowgill formula. The writers have been unable to locate any reports in the literature in which the values obtained by that formula have been correlated with the values obtained by the water immersion technique, and Cowgill himself simply states that the results are "precise enough to prove useful in physiology and medicine" (8). Basically his formula appears to express only a relationship between height and weight. One individual of given dimensions may be a highly unathletic endomorph, while another of exactly the same size in these respects may be a highly athletic mesomorph. It is not evident that the Cowgill formula differentiates between the two. This difficulty has been experienced with the Rees-Eysenck Index of Body Build and has largely resulted in its abandonment as a research tool. The theory underlying the concept of lean body mass suggests that provision must be made for the inclusion of the somatotype, or some equivalent measure, in formulae of this kind before they can be depended upon to give valid results.

If changes in the per cent body fat and lean body mass result from training and if they can be determined by use of a relatively simple formula rather than be resorting to the impractical technique of water immersion, this may prove to be the key to one of the most baffling puzzles of athletic training—that of determining whether an individual is training too hard or not hard enough. Presumably an optimal balance between lean body mass and per cent body fat exists for each sport. It is possible that the degree to which an individual approaches this optimal relationship would prove useful as an indicator of whether the severity of his training program should be increased or decreased. It is likewise possible that this relationship may hold the answer to the vexing problem of how much weight a boxer or wrestler may take off before he reaches the point

TABLE I
CALCULATED BODY COMPOSITION OF AMATEUR WRESTLERS
AND NON-WRESTLERS

Subjects	No.	Height (Inch)	Weight (Lbs.)	Spec. Grav.	Percent Body Fat	LBM	Percent Body Water
U. S. Olympic F. S. Team	7	70.1	176.36	1.071	14.0	146.76	61.8
Japanese	11	65.8	140.45	1.075	11.5	123.21	63.4
UCLA Varsity	8	69.0	171.8	1.068	15.1	145.8	60.8
Non-Wrestlers	11	71.1	177.3	1.069	14.7	150.0	61.2
Olympic & World Champion	1	65.7	135.5	1.082	8.4	124.2	65.7
Comparable Normal Subjects	81			1.068	15.0		61.0

where the loss in strength and endurance offsets the advantage of competing in a lighter weight class. One of the Olympic wrestlers had a specific gravity of 1.092, which quite closely approached the 1.098 theoretical maximum specific gravity of the LBM. It would be interesting to know whether he was at his peak at this weight or whether his performance would have been better had he been able to carry a greater percent of body fat.

It might be postulated that he would have been at his very best if he had attained the theoretical maximum, but it seems equally probable that a certain per cent body fat is necessary to furnish the fuel required to carry a man through a tournament or to meet the energy expenditure required in wrestling competitively night after night. This may be a partial explanation of the fact that calories derived from fat were observed to form about 45 per cent of the total food intake of Finnish professional wrestlers (6).

If the Cowgill formula proves to be unsatisfactory for use in the study of such problems, it may at least have the merit of contributing to the development of more sophisticated tools.

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Cont'd on Page 96

The nominating committee of the Association for Physical and Mental Rehabilitation, Julian Vogel, chairman, has announced the following slate of candidates for election to positions on the executive board. The election will take place at the annual meeting of the General Assembly. See tentative convention program elsewhere in this issue for time and date.

For First Vice President

Kenneth A. Dening, Sunmount, N. Y.
David Ser, New York, N. Y.

For Second Vice President

George Jurcisin, Chillicothe, Ohio
Ernest A. Wilbur, New Orleans, La.

For Third Vice President

Richard G. Fowler, Los Angeles, Calif.
Roland J. Gagnon, Dwight, Ill.

For Secretary

Louis Braun, New York, N. Y.
John B. Murphy, Chillicothe, Ohio

For Treasurer

Earl Mason, Louisville, Ky.
Vincent J. Oddo, Hines, Ill.

The following thumbnail sketches have been prepared in order to acquaint the membership with the nominees:

Kenneth A. Dening

Serving at present as second vice-president and chairman, membership committee . . . graduate of Springfield College with Masters in Rehabilitation . . . Entered CT in '46 at Cushing where he helped author text on crutch walking . . . later chief at Brockton, Mass.; at present coordinator, PM&RS, VAH, Sunmount, N. Y. . . . Past president of New England chapter.

Lou Braun

A charter member of the association, he is a CT supervisor at the Bronx, N. Y. VAH where he has served for the past thirteen years . . . Graduate of Rutgers Univ. with Master's from Teachers College, Columbia; at present doctoral candidate at the latter institution.

A. P. M. R. *for Office*



David Ser

Charter member of the Eastern States Chapter, he was on its executive board for several years . . . Was chairman of the association's scholarship committee, 1957 and '58 . . . At present, Chief CT at the New York VAH, he has had 13 years of experience in the field, all in the metropolitan area . . . A graduate of New York University, he has completed work for his Master's degree.



George Jurcisin

Active in the affairs of the Ohio - Kentucky - Indiana Chapter, he has served as its president and secretary to the advisory board . . . Received B.S. in physical education from Ohio State in 1950 and his Masters from the same institution in 1955 . . . Has ten years experience as staff therapist at VAH, Chillicothe, Ohio . . . Has authored three professional articles on the use of corrective therapy with psychiatric patients.

Ernest A. Wilbur

Has served for thirteen years as Chief, C.T., VAH, New Orleans . . . Graduate of NYU where he also received his doctoral degree in physical education . . . Formerly instructor in the hygiene department, CCNY, he served for three years as reconditioning officer in the Navy during WW II . . . Lectures in orthopedics at the Tulane Univ. School of Medicine . . . Served five years as member, Governor's Committee for Employment of the Physically Handicapped; two years as president, Texas-Louisiana chapter; two years as APMR chairman, professional standards committee.

Candidates 1959-1960



Roland J. Gagnon

Majored in physical education at the Univ. of Illinois where he specialized in correctives . . . During last two years of college he assisted Bob Shelton in organizing a special program for the handicapped of nearby communities . . . Entered CT immediately following graduation accepting position at Hines VAH . . . In 1954 he transferred to Dwight, Ill. as Chief CT . . . He has held most of the executive offices in the Midwest chapter.



Richard G. Fowler

Graduate of Kansas State in 1936 . . . Taught and coached in high schools; served in reconditioning program with the Army during WW II . . . Has completed graduate work at UCLA and USC . . . Served as assistant chief at Wadsworth VAH, Los Angeles for many years and is now chief of the CT program there . . . Active in association and chapter affairs, he was national treasurer in 1950 . . . At present, president, California Chapter.



Earl W. Mason

B.A., Ohio U.; M.A., Ohio State, both degrees being in physical education . . . Served as coach and athletic director of high schools in Ohio for 5 years; entered CT at its inception in VA . . . For past 12 years, Chief, CT, VAH, Louisville, Ky. . . .

Has served as president and membership chairman of the Ohio-Kentucky-Indiana Chapter and in the national association as member of the representative assembly and as research chairman.



John B. Murphy

Presently serving as president of the Ohio-Kentucky-Indiana chapter . . . Served three years overseas during WW II then entered Ohio State where he received his B.S. in physical education in 1950 . . . Served as coach and athletic director in secondary school before entering CT in 1953 . . . At present staff member, VAH, Chillicothe, Ohio.



Vincent J. Oddo

A member of the CT staff at Hines (Ill.) VAH since 1949 save for two years in which he served on active duty in the Navy . . . As CT supervisor, he received an Outstanding Performance Rating for the year 1956-57 . . . Has served for ten years as chief administrative officer, U.S. Naval Reserve with rank of Lieut. Commander.

AMERICAN BOARD FOR CERTIFICATION OF CORRECTIVE THERAPISTS

The following members have successfully passed examination for certification in corrective therapy and are entitled to be listed on the official registry:

California

Benj. W. Prescott, Jr.
Ernest G. Saenz
Peter Ysais

Louisiana

Don L. Dacus

Ohio

Wallace O. Hawkins
Harvey A. Toles

Pennsylvania

Merl A. Farabaugh

Thomas P. Juliano

John P. Renaldi, Jr.

Texas

Bill Gale
John R. Pharr

aquatics, and recreational activities and should have extensive supervised clinical and field experiences (3).

Although physical educators in schools and colleges do not work with patients *per se* and although their objectives and program of activities are largely educational in nature, nevertheless, specialized training is essential if they are to be completely effective in their efforts to meet the individual needs of boys and girls. However, until the need for such training is generally recognized and provided, physical educators must, necessarily, perform only such functions as they are qualified to do. They definitely need to recognize their professional limitations in doing so.

Conclusion

Born in antiquity, developmental and remedial physical education has had a diversity of uses through the ages. On one hand, it served nations in preparation for war; on the other hand, it was used by physicians and physical educators for therapeutic purposes. From physical education in modern times have come two technical specialties in medicine, physical therapy after World War I and corrective therapy after World War II. While great strides have been made by corrective therapy in the last dozen years, school and college developmental and remedial physical education has not generally kept pace; as a consequence, the potentialities of this field in educational institutions need to be reassessed and programs need to be redirected in accordance with the maximum benefits which may be realized.

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cal therapy, occupational therapy, and corrective therapy, too, to take this more into account.

As you see, there are resources to be had. I am sure they can be available to the physical educator as much as they are to anyone else in the educational field. For corrective therapy, this has been a long, hard row, but I am sure that there will be no question but that there will be the leveling up of the professional status of the corrective therapist in the field of therapy. As professionals in physical education, you have to gain a *certain professionalism in medicine*, too, and that is where we have had a lot of "hurrah" about this whole thing. Misunderstanding, pulling and hauling, which need not have occurred, and which, I think, can be simmered down if we will all understand this one basic fact that I just mentioned. The other day I was talking to one of the seniors who had just finished his senior course (which we had two hours a week for one quarter and which is twice what we had last year) and, he said, "You know, doctor, we are beginning to realize that there is a sort of dynamic medicine building up here, and I am very glad to have had a chance to learn a little more about the dynamics of medicine." I think he is right. Another student who came up here from California to listen in at the staff meeting at the Rehabilitation Center the other day, said, "Doctor, I am very appreciative of the chance to look around here and to sit in on the staffing of these cases. Why, you are practicing a sort of human ecology, aren't you?" And I think that is just about where I can end my talk. We are sharing in the development of a new phase, an important phase, a very challenging phase of human ecology. Thank you.

BODY COMPOSITION—cont'd from p. 93

19. Thomson, C. W., E. R. Buskirk, and R. F. Goldman, Changes in Body Fat, Estimated from Skinfold Measurements of College Basketball and Hockey Players During a Season. *Research Quarterly*, 27:418-430, December, 1956.

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"From Other Journals"

Unless noted otherwise, all abstracts have been prepared
by Philip J. Rasch, Ph.D.

J. V. G. A. Durnin, The Use of Surface Area and of Body Weight as Standards of Reference in Studies on Human Energy Expenditure. *The British Journal of Nutrition*, 13:68-71, 1959.

Individual measurements of the energy expenditure of about 160 adult subjects were used to compare gross body-weight and surface area as standards of reference for energy expenditure. M^2BSA was calculated from the DuBois formula. The multiple regression analysis showed quite clearly that there was no purpose in using surface area rather than weight. Both appear equally useful, but weight is easily and accurately measured, whereas M^2BSA is calculated and the error may be considerable.

Fat free body mass is of dubious value in metabolic studies. The methods for its determination are of unknown accuracy and body fat cannot be ignored in connection with measurements of energy expenditure.

The use of any unit of reference implies a fundamental biological error, since it infers that the (straight) regression line passes through the origin. A (straight) regression line may fit the data adequately, but if this line does not pass through the origin (which generally it will not do) the use of a ratio correction is not justified.

Very few activities are carried out at a steady rate over a long period. It would therefore appear logical to express results as Cal./min. It has been common to give energy expenditure in net Cal., with a deduction for B.M.R. The B.M.R. is usually taken from tables, which may introduce a considerable error. It appears illogical to make a deduction which, for any activity involving exercise, will be very small and of unknown accuracy.

E. J. Huth and J. R. Elkinton, Effect of Acute Fasting in the Rat on Water and Electrolyte Content of Serum and Muscle and on Total Body Composition. *American Journal of Physiology*, 196:299-302, February, 1959.

Thirteen rats were fasted acutely for 3-6 days and then killed and their body composition compared with that of rats fed on a stock diet. No differences were observed for sodium and chloride concentrations. The fasted animals showed a marked decrease of body fat, with, therefore, a larger lean body mass, consisting both of more water and more fat-free solids. The proportion of water in the lean body mass was unchanged. In terms of percentage of initial value, the mean body weight of the fasted animals showed a loss of 32%. Of this weight fat showed the greatest proportional loss; water and solids were diminished about equally but to a lesser degree than was fat.

Editorial, The Hazard of Water Enemas. *The Lancet*, 7072: 559-560, March 14, 1959.

Enemas have been used for over 2000 years, but little is known about the most desirable solutions and the indications for their use. Tap water is as effective as soapy water and less irritating to the colonic mucosa, but either may be absorbed from the colon into the blood stream and result in an acute lowering of the electrolyte concentration of the blood, causing symptoms of water intoxication. Repetition of enemas is particularly dangerous. Saline enemas may give rise to overhydration, with oedemas as a possible consequence. Those who order enemas should see that the patient is not overloaded with fluid, that there is no reason why he cannot excrete water freely, and that proper records of the amounts of fluid are kept.

Henry J. Montoye, et al., The Effects of Exercise on Blood Cholesterol in Middle-Aged Men. *American Journal of Clinical Nutrition*, 7:139-145, March-April, 1959.

Thirty-one male faculty members at Michigan State University were divided into a control group and an exercise group. The exercise program consisted of supervised calisthenics and swimming. No significant blood serum cholesterol changes were found in mean initial or final values amongst "normal" subjects in either group, although one "high" cholesterol subject in the exercise group showed a decrease significant at the 5% level. Changes in serum cholesterol generally accompanied a change in body weight, regardless of exercise.

E. A. Muller, Training Muscle Strength. *Ergonomics*, 2:216-222, February, 1959.

Muscular strength and muscle fiber-mass are strictly correlated. To keep up an unnecessarily large muscle mass is costly in metabolism and circulatory effect. The stimulus necessary for an increase of muscle strength is an increase in tension over that previously exerted. In progressive training procedures the stimulus is kept above the critical level by increase in proportion to the increase in maximum strength. The maximal rate of increase can be achieved with one single muscle contraction per day; with a one-week interval between contractions strength increases at about one-third of the speed found with a one-day interval. Very little activity is necessary to prevent the loss of contractile power. Permanent increases in muscle strength may be obtained by long-interval training or by short-interval training followed by maintenance of the trained state. It may be assumed that short-interval training increases the cross-section of the muscle fibers, whereas in long-interval training the fibers multiply and more connective tissue is produced inside the muscle per unit of cross section. The rate of strength increase is not the same for different muscles of the same person nor for those of different sexes or ages. It is not known whether there is a correlation between speed of strength increases and the endpoint to which increase is possible. Increase of strength can be prevented by a low protein intake but cannot be speeded up by a high protein intake.

Axel Marsk. Studies on Weight-Distribution Upon the Lower Extremities in Individuals Working in a Standing Position. *Acta Orthopaedica Scandinavica Supplementum No. XXXI*, Vol. 27, 1958.

An equal loading of the two feet would demand a symmetrical arrangement of the two halves of the body around a vertical projection of the center of gravity. It is obvious that this condition is seldom realized. Those working with the right hand tend to place the greater portion of the weight on the left foot. This crossed adjustment arm-leg results from the fact that basic principles of statics and dynamics act in favor of using the contra-lateral leg as the standing-leg. The most stable equilibrium is achieved by a crossed, diagonal adjustment of forces.

George B. Logan, Essential Medical Supervision in Athletics for Children. *Journal of the American Medical Association*, 169:786-788, February 21, 1959.

Essential medical supervision of children in sports consists of making sure that the child is fit to compete and in seeing that he remains fit during the period of participation. Tests of physiological maturity, coordination, and conditioning are of value, even though not highly accurate. There is little factual material on the injury rate of children engaged in various sports. Data collected on participants in the Pop Warner Football League indicate that most of the severe injuries are fractures or epiphyseal separations. Medical supervision should be available during practice sessions as well as during games.

D. P. Thomas, The Effect of Load Carriage on Normal Standing in Man. *Journal of Anatomy*, 93:75-86, January, 1959.

Carrying a heavy load on the back causes the carrier to lean forward. The normal erect posture is modified so that the center of gravity of the man plus the load approximates the center of gravity of the unloaded man. Hellebrandt has suggested that the location of the center of gravity is a "physiological constant" which it is impossible to disturb significantly in standing man. The present study was undertaken to determine how the body alters its normal alignment to achieve stability.

Bony landmarks were marked and the subjects were photographed unloaded and with various loads. With loading there was a forward displacement of the shoulders, and the same load carried in a low position caused a further displacement forward than when carried in a high position. The hips did not move significantly, but the knees moved progressively backward with increasing loads. There was no indication that these movements were affected by the height or weight of the subject.

It is suggested that for a given load the total muscular activity necessary to resist the effects of gravity will not vary significantly wherever the load is placed on the back. The trunk apparently acts as a counterbalance, altering its inclination according to the site of the load and thus keeping the projection of the center of gravity at the feet in a relatively constant position.

A. R. Dawe, Combating the Effects of Burn Toxin. *Naval Research Reviews*, April, 1959, pp. 25-27.

Following the fire at Our Lady of the Angels in Chicago on December 1, 1959, the most severely burned children received blood transfusions from individuals who had recovered from severe burns. The rationale is that a severe burn results in a release of toxic material into the blood. The badly burned individual produces antibodies slowly, often too slowly to be helpful. Blood from individuals who have recently recovered from severe burns is high in antibodies. If the theory is sound it may be possible to prepare a vaccine from burn toxin which can be administered to generate natural immunity.

M. Faulkner and E. P. Sharpey-Schafer, Circulatory Effects of Trumpet Playing. *British Medical Journal*, 5123:685-686, March 14, 1959.

Trumpeters playing high loud notes for more than a few seconds may "black-out." The circulatory effects are similar to Valsalva maneuver. A subject maintained a pressure of about 80 mm. Hg. while playing moderately loud for 17 seconds. Few normal subjects are capable of blowing a mercury manometer to this height and maintaining it at a constant level. On the top note of a loud arpeggio the subject reached a pressure of 160 mm. Hg. The trumpet appears to require the highest intrathoracic pressures of any instrument. Vasodilatation from heat or previous hyperventilation will exaggerate the effects of a given interthoracic pressure.

Martti Karvonen *et al.*, Cigarette Smoking, Serum-Cholesterol, Blood-Pressure, and Body Fatness. *Lancet*, 7071:492-494, 7 March 1959.

Finnish men aged 20-59 were studied. Smokers tended to have a higher average serum-cholesterol value, slightly lower blood pressure and to be thinner than did non-smokers. The fact that higher blood cholesterol level is associated with an increased susceptibility to ischaemic heart disease may help to explain the reported disparity in heart disease mortality between smokers and non-smokers. The fact that higher blood cholesterol level is serum-cholesterol level to rise, since the kind of person who smokes may constitutionally tend to an elevated blood-cholesterol, low blood-pressure, and thinness.

Stewart Wolf, Cardiovascular Reactions to Symbolic Stimuli. *Circulation*, XVIII:287-292, August, 1958.

Symbolic stimuli derive their force not from their intrinsic qualities but from their significance to the individual. Cardiovascular symptoms, disability and death may result. In this category may be classified "voodoo death." Fainting during injections and death from snake bite when the dose is not lethal may indicate that there is a general, largely unconscious, threatening significance in having the skin pierced. Death by drowning may often be attributable to excessive vagal effects rather than to asphyxia.

Patients with essential hypertension, as well as normal subjects, display an increase in arterial pressure when brought into threatening situations. The renal vasculature shares in the circulatory response. Thus life adjustment may involve initial renal ischaemia, which in turn sets off endocrine and humoral mechanisms, with the ultimate development of irreversible tissue damage. The hypertensive subject tends to display a need to excel but at the same time to avoid conflict or too vigorous self-assertion. This dilemma leads to non-committal attitudes. It is probable that most adaptive functions of the cardiovascular system are responsive to stimuli that owe their force to their special significance to the individual.

It is unnecessary to exercise an individual in order to induce the characteristic hemodynamic adjustments. They may be called forth by the mere discussion of exercise. The patient with coronary artery disease is oriented to a life of effort. Periods of emotional stress may activate the lipid mobilizing mechanism "as if" great muscular effort were required. This may explain the favorable results reported when coronary patients engage in vigorous muscular exercise. If the individual is "in training" cardiovascular efficiency may be such that a relatively great load may be carried with a minimum of work.

Symbolic stresses may activate disease mechanisms due to the fact that most bodily organs are connected with and responsible to impulses reaching them via automatic and endocrine pathways from the highest integrative centers of the nervous system.

Alan K. Done, The Uses and Abuses of Antipyretic Therapy. *Pediatrics*, 23:774-780, April, 1959.

Therapists and pharmaceutical concerns have sought for better drugs for the control of fever. More critical is the question of whether such therapy is indicated. DuBois suggested that fever might be a friend rather than an enemy. Body temperatures greater than 106° F. seldom occur. It is doubtful whether body temperatures of 104° F. are harmful even if prolonged for several days. This temperature level is found in athletes during the hard exercise. Thus the rationale for the administration of antipyretics is open to serious question. The practice of bundling a patient in heavy blankets interferes with heat loss. Cooling the sick room and increasing the circulation of air about the patient are helpful. Cautious sponging with tepid water may be used.

Bert Hanman, Climbing Up Stairs. *Industrial Medicine & Surgery*, 28:67-68, February, 1959.

Many persons believe that they climb stairs for a much longer time each day than is actually true. Because of this belief it is probable that many individuals with medical restrictions on their climbing could safely climb considerably more than they do. Several hundred climbers in Boston subways and buildings were timed. The rate climbed by 81% of the subway climbers was 2 steps per second, regardless of the variations in the height of the steps in the various stations. In actual climbing time, 120 flights of 15 steps per flight could be climbed in 15 minutes of average climbing. It is likely that people do not climb stairs nearly as much as they believe they do.

Aaron H. Kleiman, "Hematuria in Boxers." *Journal of the American Medical Association*, 168:1633-1640, November 22, 1958.

A three year study of 764 professional boxers indicated that boxing hematuria is usually traumatic and mechanical in origin. The incidence of significant hematuria was twice as high in white as in nonwhite pugilists. Increased time in the ring increased the tendency toward significant hematuria. The kidney disorders most frequently diagnosed were hydronephrosis and movable kidney, none of which required surgical intervention. Excessive mobility occurred three times as frequently in white as in nonwhite boxers. Boxing trauma may result in rupture of the veins about the renal papillae or pyramids. The resulting hemorrhage may cause intercapillary compression about the nephrons. Later a clot may form, with proliferation of connective tissue. An area of scar tissue results, producing the characteristic pericalyceal deformities of "athletic kidney." Although these changes appear to be permanent, only mild impairment of renal concentration power was shown.

A. Zinovieff, "Redevelopment of Muscle Power and Volume." *Journal of the Society of Remedial Gymnasts*, 16-18, 1959.

Although a number of different techniques of weight training have been described in the literature, little is known of their comparative values. It was the purpose of this study to compare the effects of three different techniques: (1) heavy resistance-low repetition; (2) medium resistance-medium repetition, and (3) low resistance-high repetition in the production of power and hypertrophy in the quadriceps of a consecutive series of patients at the Durham Miner's Rehabilitation Centre. A satisfactory increase in power was achieved with each of the three techniques in over 80% of the cases, and there appeared to be nothing to choose between them as a method of developing muscle power in traumatic cases. The low resistance-high repetition method proved best for building muscle volume.

Merle S. Scherr, "Physical Conditioning Program for Asthmatic Children." *Journal of the American Medical Association*, 168:1996-2000, December 13, 1958.

When physical exercise is forbidden, asthmatic children may develop a loss of the initiative and confidence necessary for personality adjustment to life. The Charleston, W. Va., Y.M.C.A. offers the asthmatic child a program incorporating both breathing exercises and physical activity. Emphasis is placed on diaphragmatic breathing, costal breathing, and asymmetrical breathing, as recommended by the Asthma Research Council, London. Postural exercises are done between breathing exercises. Gymnastics are performed under supervision. Combative training designed to increase self-confidence is given those with kinesiologic skills. With but few exceptions the children have shown improvement in school, home, and church activities, a lessening of the frequency and severity of asthmatic attacks, and a definite emotional adjustment improvement.

J. P. Guilford, "A System of Psychomotor Abilities." *American Journal of Psychology*, LXI:164-174, March, 1958.

Known psychomotor factors include strength, impulsion (rate at which movements are initiated from a stationary position), speed (rate of movements after they have started), static precision, dynamic precision, coordination, and flexibility. The first two seem to be general factors; the others appear to represent simultaneous involvement of two or more regions. Possibly the former are more dependent on heredity and the latter on experience, but this possibility should not be stressed too much. Undiscovered primary psychomotor abilities may include muscular endurance, circulatory-respiratory endurance, agility, and power, but these may be syndromes of physiological characteristics. Studies are needed of the intercorrelations between anatomical and physiological traits. The properties of bone and muscle, and the manner in which they are put together should have much explanatory significance in accounting for many psychomotor abilities. Neurological parts and properties may account for many of the observed distinctions.

S. David Pomrinse, "Marginal Man: a Concept of the Aging Process." *Geriatrics*, 13:765-766, November, 1958.

Aging is a progressive reduction of reserves, and an aged person is one whose reserves have been reduced to the point where he is approaching the margin between independence and dependence. He is, therefore, more likely to be thrust over the margin by stress and trauma than is the younger person and is thus in greater need of supportive measures during periods of stress. What are needed are (1) intensified research aimed at measuring reduction of reserves, and (2) intensified application of preventive measures. Marginal persons are not fully participant in the group. Aging includes physiologic, psychologic and social changes. The goal of treatment is to help reestablish sufficient resources so that the patient can function by himself. Help from a group of therapists is probably the most realistic approach. Many older persons capable of and willing to work are forced to retire. To avoid unnecessary and wasteful removal of such persons from society the older person must be paced by his ability to function.

Charles K. Sergeant, Joseph L. Ponka, and Brock E. Brush. Effect of Antibacterial Agents on Clean Wounds. *AMA Archives of Surgery*, 78:480-482, March, 1959.

Substances for application to wounds continue to be offered, despite the fact that chemicals applied to wounds generally retard their healing. The effects of achromycin, aureomycin, bacitracin, chloromycetin, neomycin, polymyxin B, and terramycin on an abdominal wound in guinea pigs were observed by comparison with an untreated control wound. Generally no effect was noted, except in the case of aureomycin, which delayed healing two to six days.

Fritz Buchthal, Francesco Ermino, and Poul Rosenfalck, Motor Unit Territory in Different Human Muscles." *Acta Physiologica Scandinavica*, 45:72-87, 1959.

A multielectrode was used to record the spread of action potentials from motor units of different human muscles. The active muscle fibers of a motor unit were found to be confined to a circular area 5-7 mm. diameter in muscles of the upper extremity and 7-10 mm. in the lower extremities. Territory and maximum voltage of a motor unit did not vary significantly with age or degree of development of the individual muscle. If recordings differ more than 2 mm. from averages for the upper extremity, or more than 3-4 mm. from averages for the lower extremity, it may be indicative of pathological conditions.

Henry D. Janowitz, "Hunger and Appetite: Physiological Regulation of Food Intake." *American Journal of Medicine*, XXV: 327-331, September, 1958.

The physiologic mechanism which regulates caloric intake is both complex and subtle. Only an incomplete account can be given of its nature. What it regulates is probably the body's store (excesses or deficits) of nutritional elements. It is a function of the hypothalamic centers to inhibit or facilitate certain feeding sensations. Stimulation of the oropharyngeal receptors associated with tasting, chewing, and swallowing food contribute to controlling the amount of food ingested by inducing temporary satiety. Gastric distention reinforces the inhibitory effect of the volume of food ingested on subsequent intake. Gastrointestinal metering is probably operative only in short-term regulation; the metabolic consequences are probably to be sought in long-term regulation. Among the factors involved may be the body's store of water, changes in water concentration, biochemical changes in the hypothalamus, thermal stress, glucose utilization, fat depots, and levels of metabolites in the blood. From the standpoint of energy-exchange, it may be the extra heat released by the assimilation of food (specific dynamic action) and not the calories *per se* which are measured. Only a multiple factor analysis can do justice to the problem. Variabilities in the functioning of this regulating equipment may be responsible for certain types of "regulatory" obesity. Food-taking is a homeostatic mechanism worthy of being studied in itself along with the other physiologic regulations of the body.

Chapter Activities

Ohio-Kentucky-Indiana Chapter

The Dayton Veterans Administration Center was host to the joint meeting of the Ohio Valley Chapter of the American Association for Rehabilitation Therapy and the Ohio-Kentucky-Indiana Chapter of the Association for Physical and Mental Rehabilitation of April 25, 1959. This meeting of rehabilitation specialists was open to the public.

Mr. Ray Q. Bumgarner, Manager of the V.A. Center, and Dr. Charles C. Thomas, formerly of Kecoughton, Virginia, now Director of Professional Services at the Dayton V.A. Center, welcomed the combined groups in the Brown Hospital Auditorium.

A panel of specialists in the field of geriatric rehabilitation was moderated by Dr. Leo Rosenberg, Chief of Physical Medicine and Rehabilitation of the Dayton V.A. Center and chairman of the advisory board of the Ohio-Kentucky-Indiana Chapter of the A.P.M.R.

This panel of specialists included Dr. Mir Nisam, Chief of the Dayton V.A. Center Geriatric Hospital; Mrs. Catherine Peters, R.N., Nursing Supervisor, former Chief Nurse of the Geriatric Hospital; Marie K. Oswald, Ph.D., Chief of Social Services; Ray Yates, Corrective Therapist; Edward G. Davis, President of A.A.R.T. and Clifford Nordstrom, Chief of Special Services.

Following the panel presentation, geriatric case histories were presented by W. J. Randall, Chief of Corrective Therapy at the Dayton V.A. Center.

At 1:00 p.m., Mr. Leon E. Edman, Chief of Domiciliary Services, V.A. Center, Dayton, Ohio, presented a paper "Challenges for P.M.R. in the Domiciliary Program."

After the conclusion of Mr. Edman's speech, the Ohio-Kentucky-Indiana Chapter of the Association for Physical and Mental Rehabilitation held its business meeting. Highlights of the meeting were: Mark Howett assumed the office of president of the chapter; Earl Mason was elected to the office of president-elect; and Worth Randall as representative assemblyman to A.P.M.R.

Midwest Chapter

The spring meeting of the Chapter was held April 12 at the VA Center, Wood, Wisc., and featured a talk by William Milne and F. F. Verbeten on "A Pilot Study Program for Domiciliary Patients." The following officers were elected to serve two year terms: President—Leslie M. Root, Milwaukee; Vice President—Carl Peterson, Chicago, and Secretary-Treasurer—George Nash, Milwaukee. The Chapter voted to donate \$100.00 to the association's scholarship fund and appropriated \$150.00 to help defray expenses of President-Elect Norman N. Tenner and two Representative Assemblymen, Leslie Root and Melvin Sader, who will be attending the 1959 convention in Miami, Fla.

Book Reviews

"Artificial Limbs, Spring, 1958." (Washington, D.C.: Prosthetics Research Board, 154 pp.)

This issue is largely given over to a description of field studies in upper-extremity prosthetics carried out under the direction of the College of Engineering of New York University. The material covered deals only with the educative aspects of the work, and is divided into three sections: Design and Scope, The Population, and The Treatment Process. It is profusely illustrated with specimen forms and charts. The next issue will take up the research implications of the collected data. Anyone planning similar studies will be well advised to give careful consideration to these studies.

PJR

"Consciousness and the Chemical Environment of the Brain." (Columbus: Ross Laboratories, 1958. 109 pp. Paper. Free.)

This report of the 25th Ross Pediatric Research Conference covers the following areas: (1) Physiologic Influences on Cerebral Metabolism; (2) Bio-Chemical Factors in Cerebral Metabolism; (3) Systemic Effects of Renal Failure; and (4) Hepatic Coma and Bilirubin Encephalopathy. Following each of the presented papers there is a discussion by recognized authorities in the field, with a bibliography. The conference transcript of the program has been well edited; the material is factual and correlates the latest research information on subjects of general interest in the practice of pediatrics. Any one who is interested in sound research in neurophysiology and chemophysiology will find much stimulating and worthwhile reading in this small book.

DCL

"Re-education of the Injured Shoulder," by R. Barrie Brookes. (Baltimore: The Williams & Wilkins Co., 1959. 114 pp. \$3.50)

The predominant concern of this book is with the most common periarticular lesions of the shoulder at middle age as treated by conservative measures in the physiotherapy department. It is Brookes' experience that following even extensive rotator cuff defects, the remaining cuff components and biceps can be re-educated so as to fix the humerus in the glenoid for effective scapulohumeral function.

Heat is described as disappointing for the relief of pain or spasm, which is not surprising since the discussion is limited to the alternatives of infra-red or short-wave diathermy. Moist heat is not mentioned. The suggested manipulative therapy for passively gaining range of motion is certainly less effective than the better known Mennell-type procedures.

Inadequate consideration is given to the fact that much shoulder pain originates outside of the articular or periarticular tissues of the shoulder joint proper. An uncontrolled "study" is barely sketched wherein the author's methods were utilized, but it hardly permits clinical impressions, much less conclusions.

English medical writers are usually noted for clarity and brevity, so it is startling to see the well-known pendulum exercises for the shoulder described as a "half lax reach stoop stride standing (opposite hand supported on thigh); single arm circling in front of body."

It is for the section on a program of active and passive therapy for rotator cuff and traumatic shoulder lesions and for clearly presented, if undocumented, rationale for the therapy that the book is to be recommended with the expectation that the therapist or physician filtering its contents through his experience and training will be left with much of solid practical value.

DJS

"American Academy of Physical Education Professional Contributions No. 6." (Washington, D.C.: American Association for Health, Physical Education and Recreation, 1958. 154 pp. \$2.00. Paper.)

This volume contains three "Selected Reports" made at the 1957 annual meeting of the American Academy of Physical Education, and nine studies, two "Special Reports," the R. Tait McKenzie Memorial Lecture, and "Awards, In Memoriam, and Roster," all apparently dating to the 1958 meeting. Five of these papers—those by Cureton, Karpovich, Clarke, Steinhaus, and Dill—deal with the physiology of exercise in one form or another and will thus be of special interest to corrective therapists. Of these the outstanding article is the one by Dill on "Fatigue and Physical Fitness." Generally speaking, these papers tend to review the state of existing knowledge in a given area rather than to present new theories and research materials.

The balance of the publication deals largely with problems of teacher preparation graduation requirements, evaluation of teaching and similar topics. For the most part these will be of interest only to those teaching at the college level. An exception to this is a very interesting survey of "The European Sports Scene" by Seward C. Staley.

PJR

"Clark W. Hetherington: Scientist and Philosopher," by Alice Oakes Bronson. (Salt Lake City: Alice Oakes Bronson, Gymnasium Building, University of Utah, 1958. Multithed, paper. 148 pp. \$2.00.)

Clark W. Hetherington found school physical education an extra-curricular activity; he left it a recognized part of the curriculum, taught by graduates of professional education courses. In between he found time to play a leading role in such organizations as the American Academy of Physical Education, American Physical Education Association, Boy Scouts of America, College Physical Education Association, National Education Association, Playground Association of America, and many another. His name is known to everyone who has studied physical education; that but little more is known is probably due to his failure to systematically expound his ideas in textbook form.

Alice Oakes Bronson, Professor of Physical Education at the University of Utah (and an associate member of APMR, with special duties in regard to recruitment and supervision of physical education majors in corrective therapy in connection with the clinical program at Fort Douglas Hospital), has here addressed herself to the problem of making this man better known to those who profited so greatly from his labors. What emerges is a dedicated perfectionist, one who fought continuously for the development of education in general, and physical education in particular, as a science. Big muscle natural activity, teacher training, life adjustment, organic vigor, and health were goals which he sought indomitably and humorlessly, often at the sacrifice of his own health and finances. Those who read this book cannot fail to be impressed with how much our profession owes to this man. His labors deserve to be far better known than they are. A copy of this book should be on the shelves of every school of education or physical education in the United States.

PJR

"The Mentally Retarded Child at Home," by Laura L. Dittman. Children's Bureau Publication No. 374. (Washington, D.C.: U.S. Department of Health, Education and Welfare, 1959. 99 pp. Paper. 35c)

This pamphlet is written in a readable style for the average American family. It does a first rate job as follows: 1. It explains the backgrounds for mental retardation; 2. It suggests ways for accepting and managing the mentally retarded child; 3. It encourages families to meet the problems of mental retardation in an objective and sympathetic manner.

The problem is to get this pamphlet into the homes where it belongs.

NWF

"A Concise Textbook of Anatomy and Physiology Applied for Orthopaedic Nurses," by Joyce W. Rowe and Victor H. Wheble. (Edinburgh: E. & S. Livingstone Ltd., 1959. Distributed in the United States by The Williams & Wilkins Company, Baltimore. 684 pp. \$8.00.)

This text is "designed to cover the syllabus for the Orthopaedic Nursing Certificate of the Joint Examination Board of the British Orthopaedic Association and the Central Council for the Care of Cripples." How well it fulfills its task an American reviewer is unable to judge, but the fact that each chapter is followed by several questions taken from previous examinations probably makes it worth the price to anyone sitting for the above certificates.

In general the approach is to describe the system and then to offer a few comments on how the anatomical or physiological phenomena under consideration are involved with surgical or pathological conditions. A short and very unsatisfactory chapter on posture and body mechanics completes the text.

There is no bibliography and while the text is profusely illustrated by line drawings, many of them are not too well done. The copy sent this reviewer contained two distinctively different types of paper, and the covers appear to be of paper. At the price it is believed that corrective therapists will find it more profitable to invest their money elsewhere.

PJR

"Progressive Exercise Therapy," by J. M. P. Clarke. (Bristol: John Wright & Sons Ltd., 1958. 184 pp. \$4.50. The Williams & Wilkins Co., Baltimore, exclusive U. S. Agents.)

In the United States the term progressive exercise is practically synonymous with weight training, largely, perhaps, because of the popularity of the DeLorme-Watkins book *Progressive Resistance Exercise*. An American reader is thus likely to equate "progressive exercise" with "progressive resistance exercise." If so he will be led astray, since this work by the Principal of the School of Remedial Gymnastics deals only with calisthenic type exercises, stall bars being the main piece of apparatus utilized.

Approximately three-quarters of the text is devoted to the description of exercises for the various parts of the body. The remainder presents tables of recommended exercises for post-surgical use. A final chapter suggests general exercises to be performed to music and very briefly discusses circuit training. An appendix describes exercise terminology and a bibliography and index complete the contents. The bibliography suggests that the author is unfamiliar with American books on the subject, including the DeLorme-Watkins opus.

In effect this is a modern presentation of the old Ling gymnastics long out of favor in the United States, partly because patients find them intolerably dull and partly because weight training gives so much greater results for the same amount of time. Nevertheless there is usually a period during which a patient is not ready to assume the stresses of weight training but can safely employ calisthenic exercises. Colson's book contains many suggestions which may be profitably employed during this interval.

PJR

The History and Development of Shri Hanuman Vyayam Prasarak Mandal, by Shri H. V. Deshpande. (Amravati, India: Saraswati Printing Press, n. d. 52 pp. Paper.)

The Premier Institution of Physical Education was founded by the Vaidya brothers in 1914 as a secret organization working to link physical education to the nationalist movement in India and to modernize and systematize the traditional Indian system of exercises. Since then it has trained approximately 15,000 men and women physical educators and attracted world-wide attention by its demonstrations. This booklet gives a brief, laudatory history of the Institution, followed by a miscellaneous collection of data regarding the number of students, location of summer schools, comments by Indian leaders and European newspapers, lists of demonstrations by various teams, and similar matter. The list of subjects taught shows a large number of courses in fencing—axe, sword, dagger, lathi, and other weapons. It is to be ardently hoped that someone at this school will produce a text in English on the techniques involved.

PJR

"Fit to Teach." (Washington, D.C.: American Association for Health, Physical Education and Recreation, 1957. 249 pp. \$3.50)

This is a rewritten version of a similar volume published by the National Education Association in 1938, and is designed primarily for school teachers, administrators, and personnel associated with the school health program. The main body of the book is concerned with today's major health problems which have the greatest effect upon adults and the aging, and the various means of preventing, controlling, and treating them. One chapter is devoted to the implications of a teacher's health and its common effect upon pupils.

The writers point out that the school environment may provide many factors detrimental to the physical and mental health of the teacher. Examples include poor school environment, constant pressures, interpersonal relationships, lack of recognition, and excessive teacher load. Administrative responsibilities dealing with retirement, insurance, salaries, and general policies all are related to the emotional health and attitude of the teacher.

The book is quite readable and a good reminder to all school personnel of what is expected from them and what they may expect in return.

"Proceedings of the Borden Centennial Symposium on Nutrition." (New York: The Borden Company Foundation, Inc., n.d. 144 pp. Paper)

These *Proceedings* consist of papers presented at the Borden Centennial Symposium on Nutrition, held in New York City on April 12, 1958. An opening statement on nutritional problems was followed by talks on the nutrition of the mother and the baby, the child, the adolescent the mature individual, and the elderly. Each paper is followed by a bibliography. Most of these talks were definitely factual in nature and bring together in convenient form a summary of our knowledge of nutrition as it applies to the various age groups. The presentation by D. P. Cuthbertson on the nutrition of the adolescent is outstanding. The individual talks were followed by a panel discussion of nutritional problems during the next hundred years, remarks made at the presentation of the Borden Centennial Awards, a talk given at the closing banquet, "Science and Human Nature: Retrospect and Prospect," by Leonard Carmichael, Secretary of the Smithsonian Institute, and some comments by the president of the Borden Company, Harold W. Comfort. The Symposium appears to have been very much worthwhile and the *Proceedings* are recommended to every reader interested in nutritional problems.

DCL

"Physiology of Muscular Activity," by Peter V. Karpovich. 5th Edition. (Philadelphia: W. B. Saunders, 1959. 368 pp. \$5.50)

This is the fifth edition of the text introduced in 1933 by E. C. Schneider, and is distinguished from previous editions by style and format, although some reorganization of material has taken place. A more personal, largely anecdotal, style of writing is now used, study questions have been added to each chapter, and the photographs of the previous edition have been replaced with line drawings. The phenomenological aspects of physical activity are well documented in this edition as they were in previous ones, and the new material, particularly the discussion centered about "warm-up," should be of interest to every student anticipating graduate research in physical education.

WRP

"Behaviour and Physique," by R. W. Parnell. (London: Edward Arnold Ltd., 1958. Distributed in the United States by The Williams & Wilkins Company, Baltimore. 134 pp. \$7.00)

Corrective therapists, physical anthropologists, and osteopaths share one fixed belief: somehow structure and function must be interrelated in all aspects of human life. Parnell puts it succinctly: "there is still need . . . for . . . an adequate classification of people which will at once describe and outline the course of physical, intellectual and emotional life likely to be followed in health by a child of known type and parentage." Sheldon's somatotyping procedures are valuable but difficult to learn and contain a large amount of subjective opinion. Parnell proposes use of what he calls the phenotype, based on a series of measurements which are entered upon a special chart and from which estimates of Fat, Masculinity, and Linearity can be made. While these factors are closely related to endomorphy, mesomorphy, and ectomorphy, the phenotype describes the living body as it appears at the moment, while somatotyping purports to describe persistent structural qualities which do not alter with the years.

The author presents data gained by use of his system in such areas as family life, academic circles, and mental health. Typical of the problems he raises is his finding that teachers of physical education are almost entirely confined to persons of dominantly muscular builds, which leads him to question whether a profession composed of individuals of such a sharply limited range of physique can understand the needs of the two-thirds of their pupils who have different somatotypes.

The value of phenotyping will require further study, but it offers an objective approach to a field that is of

great interest, and one in which corrective therapists could well initiate systematic and valuable research. The book is illustrated with several pictures, but a better selection of typical phenotypes would have been more helpful. Appendices containing some discussion of statistical procedures and tables for computing the ponderal index; a selected bibliography, and an index complete a text which is recommended to the careful consideration of everyone interested in the problems with which it deals.

PJR

"Index and Abstracts of Foreign Physical Education Literature, Volume III," edited by Henry J. Montoye. (Indianapolis: Phi Epsilon Kappa Fraternity, 1958. 61 pp. Paper.)

This volume strikes the reader as being without rhyme or reason. Most of the material is from 1956-57 publications, but there are occasional odd items dating back as far as 1928. Many of the abstracts are from articles which have no observable connection with physical education—Charles Dickens and the exploitation of child labor, warming and ventilation in British homes, driver's aptitude testing, social structure among the Zulu, public speaking, etc. In the case of *Pediatricians Emergency Primer* the abstractor himself notes that "it is beyond the scope of the specific interests of the field of physical education." Why, then, was it included? It appears likely that such standard guides as *Excerpta Medica* and the Abstract column of this Journal were not utilized in the collection of this material. It seems odd to note *Acta Physiologica Scandinavica* described as a "physiology of exercise journal." This publication describes itself as a magazine of "Physiology, Medical Chemistry or Pharmacology by Scandinavian authors or from Scandinavian laboratories." *Arbeitsphysiologie* has been combined with another publication and no longer appears under that name. The need for an index becomes more urgent with each issue.

The work being done is important, and it is highly desirable that it be continued and expanded. It is noted that the editor signs himself as "Temporary Editor," which suggests that the publication may be having growing pains. It is to be hoped that these will work themselves out and this will settle down into the valuable guide which it shows promise of becoming.

PJR

Outline of Fractures Including Joint Injuries, by John Crawford Adams. (Baltimore: The Williams & Wilkins Co., 1958. 268 pp. \$6.50)

This clearly and well written second edition by the assistant editor of the *Journal of Bone and Joint Surgery* should be welcomed by therapists, medical students, and the physician whose contact with fractures is only sporadic. The latter group will find, however, that at times insufficient space is allotted to the physical diagnostic features of certain fractures. Illustrations are numerous, well chosen, and easily understandable. Skull and facial fractures are excluded. A conservative approach to fracture management is generally favored, and the contribution of the therapist is stressed. There is no bibliography.

D.J.S.

BOOKS RECEIVED

Health and Physical Education Microcards. (Eugene: University of Oregon.)

15 March 1959 Supplement to 1 October 1958 Bulletin.

"A Profile of the Health Insurance Public." (New York: Health Insurance Foundation, 1959, 44 pp. n.d., Paper)

A national survey of public attitudes toward health insurance.

News and Comments

SPINAL CORD INJURY CENTER OPENED

One of the most complete hospital facilities ever designed for care of patients with spinal cord injuries is now in full operation at the Veterans Administration hospital at Long Beach, Calif. This spinal cord injury center cares for 205 patients in the hospital and for 980 outpatients, and has a separate section to handle visits of former patients who are working at various jobs in the area. The facilities for paraplegic and quadriplegic patients occupy the first floor and lower level of a new \$8-million, 296,000-square-foot expansion of the hospital, which replaced 20 temporary buildings on the site. Upper floors of the four-level expansion are used for general medical and surgical hospital activities.

Incorporating ideas of the staff of the hospital's spinal cord injury service and the building committee of the Paralyzed Veterans Association, the spinal cord injury center is built as a central core with five wings extending eastward.

Doctor's and other specialists' offices are located on one side of the first floor corridor of the central core, with treatment facilities and consultation rooms directly across the hall from each office. Patients' rooms and ward areas are located in the five wings of the first floor.

Medical and vocational rehabilitation areas are in the lower level. These areas, some of which are used by general hospital patients as well as spinal cord injury patients, include a machine shop and carpentry, photography, weaving, jewelry making, metal work, lapidary, and radio repair facilities.

The center has a 33x100 ft. L-shaped exercise clinic, a cystoscopy clinic, a central bath area, a 40x25 ft. therapeutic pool, and specially designed brine tanks.

The central nursing area, with bath and toilet facilities, provides the most economical and most efficient method of caring for the some 50 percent of the center's hospitalized patients who are almost completely helpless, according to Dr. Ernest Bors, chief of the spinal cord injury service at the hospital.

In contrast to costly individual facilities for each quadriplegic patient, the central area requires fewer nursing personnel and can handle more patients, Dr. Bors said, adding:

"Also for the first time we now have adequate space for vocational facilities and for our psychologist, social worker, nursing supervisor, supervisor of technicians, minor operating room, cystoscopy clinic, conference room, and laboratories."

The center's program calls for coordination of other hospital facilities with those of the spinal cord injury service. Specialists from the other professional services of the hospital are available for consultation and coordinated research, and the general hospital's dietetic, major surgical, and radiology facilities are used by spinal cord injury patients. Such coordination is necessary, Dr. Bors feels, and he therefore does not recommend that a center of this type be built as a totally separate unit.

DR. ARNETT APPOINTED

Appointment of Dr. Thomas M. Arnett, Veterans Administration area medical director in Trenton, N.J., as a deputy director for planning in the VA Department of Medicine and Surgery in Washington, D.C., has been announced by the agency.

In his new position, Dr. Arnett will assist Dr. Irvin J. Cohen, the VA assistant chief medical director for planning, in planning and coordination of the professional services of VA's 171 hospitals and some 100 outpatient clinics across the nation.

Dr. Arnett has been area medical director for the VA at Trenton since April 1954.

VA GUARDING AGAINST STAPH INFECTIONS

The Veterans Administration has announced it is undertaking in its hospitals a strict program of preventive measures against hospital infections, including those from drug-resisting staphylococcus. Dr. Irvin J. Cohen, VA assistant chief medical director for planning in Washington, D.C., said the new program is a precautionary move based largely on recent findings of a six-hospital VA study that has been underway for about 18 months to prevent hospital infections. He emphasized that there has been no serious outbreak of this sort of infection in VA hospitals.

The large-scale cooperative VA research study indicates an unexpected prevalence of the drug-resistant microbes among VA patients at hospital admission, increasing likelihood that several strains of staphylococcus are dangerous as potential causes of drug-resistant infection, and a constant buildup by the microbes of resistance to the commonly used antibiotic drugs, Dr. Cohen said.

He said the new VA preventive program will be carried out jointly by the agency's hospitals and by VA area infectious disease reference laboratories, with coordination by the VA area medical offices and VA Central Office in Washington, D.C.

Each VA hospital will establish its own infection committee with representation from all major hospital departments, including administrative, all clinical, nursing, housekeeping, and laboratory.

The committees will develop and monitor standards of "scrub and sterilize" cleanliness for the entire hospital and will make frequent checks to spot any rise in infection before an outbreak can occur. Periodic reports will be submitted to VA area and Central Office authorities.

The area reference laboratories will help the hospital committees by identifying organisms and testing these for drug resistance. The laboratories also will develop any special studies of drug-resistant staphylococcus that may be needed.

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RUSS WILLIAMS PROMOTED

Appointment of Russell C. Williams as chief of the Veterans Administration rehabilitation program for blinded veterans has been announced by the agency. Mr. Williams is a war-blinded veteran who has dedicated his life to helping others who have lost their sight. He will transfer to VA Central Office in Washington, D.C., from the Hines, Ill., VA hospital, where he has been chief of rehabilitation activities at the VA's unique Blind Center since its founding in 1948.

Mr. Williams' achievements have been for more than a personal triumph over blindness. The center, which conducts the only program of its kind in the VA and the Armed Forces, has helped some 470 blinded veterans to "see" with walking canes, to overcome fear in doing ordinary things, to use power tools and appliances for the blind, and to become independent, useful citizens.

In recognition of his outstanding accomplishments, the Blinded Veterans Association presented him its Achievement Award in 1953 and the American Veterans of World War II (AMVETS) presented him their highest honor, the National Rehabilitation Award, in 1956. He received the Achievement Award in Rehabilitation from APMR in 1954.

Born February 19, 1918, in Auburn, Ind., Mr. Williams received a B.S. degree in education from Central Normal College at Danville, Ind., in 1941. From September of that year until May, 1942 he was athletic director and a teacher at Dillsboro High School in Dillsboro, Ind.

He entered active duty with the Army in June, 1942, and in August, 1944 he was blinded by an exploding shell in France. After hospitalization by the Army, he became a special counselor to blinded soldiers at the Army's Valley Forge General Hospital at Phoenixville, Pa., in October, 1945.

A gangling, fast-walking man who looks somewhat like Abe Lincoln, Mr. Williams was a central figure in producing the VA training film, "The Long Cane," which has been distributed and shown nationally to demonstrate techniques to rehabilitate the blind. He is married and has four children.

CEREBRAL PALSY GROUP ELECTS

The American Academy of Cerebral Palsy elected the following officers at its 12th annual meeting in Providence, R. I.: Alvin J. Ingram, M.D., Memphis, Tenn., President; Raymond B. Rembolt, M.D., Iowa City, President-Elect; Temple Fay, M.D., Philadelphia, Vice President; Glidden L. Brooks, M.D., Providence, Secretary; and Samuel B. Thompson, M.D., Little Rock, Ark., Treasurer. The 1959 meeting will be held at the Hotel Statler, Los Angeles, November 30 - December 2.

NP DISCHARGE RATE INCREASES

A 20 percent increase in the number of veterans with severe mental illness recovering and leaving Veterans Administration hospitals on trial visit to their home communities has been reported by the agency. VA said its hospitals placed 8,076 mental patients on trial visit during the first six months of fiscal year 1959. This is a 20 percent increase over the 6,736 patients placed on trial visit from VA hospitals during the first six months of fiscal 1958.

The 13,332 placed on trial visit during the entire fiscal year 1958 is only a slight increase over the 13,200 in fiscal 1957 but is an 8 percent increase over the 12,351 in fiscal 1956, a 34 percent increase over the 9,985 in fiscal 1955, and a 75 percent increase over the 7,617 in fiscal 1953. Most of the patients leaving the hospitals on trial visit have been treated for severe mental conditions, VA said.

The average daily patient load of mentally ill veterans in VA hospitals has remained at around the same number since the beginning of fiscal year 1956, following an increase between 1953 and 1956. Currently, the figure is 57,103, which includes 51,871 veterans with severe mental illness and 5,232 with less severe psychiatric disorders.

VA said the increase in patients on trial visit can be attributed to changes in therapies (including use of tranquilizing drugs and more emphasis on individual and group psychotherapy), to an increase in open wards, and to reawakened interest in development of new habits of resocialization to prepare patients for return to community living.

HEREDITY AFFECTS USE OF ISONIAZID

Ability of the body to use the anti-tuberculosis drug, isoniazid, is influenced by heredity, Veterans Administration research indicates. This study of the drug, which is one of the most effective medications in treating tuberculosis of the lungs, was conducted by H. William Harris, M.D., R. A. Knight, Ph.D., and M. J. Selin, bacteriologist, of the Salt Lake City VA hospital.

Among Americans of Northern European ancestry taking isoniazid by mouth, about 50 percent have relatively high levels of the drug in their blood and the other 50 percent have relatively low levels, the doctors reported. In addition, the study showed that almost all Americans of Oriental ancestry are able to maintain only low levels of the drug following the same dose.

These findings suggest that two different types of individuals, with respect to inactivation of isoniazid, exist among those of European ancestry and that the amount of isoniazid in the blood of humans taking the drug is determined by genetic factors, the doctors said.

These studies indicate that the basis for relatively high blood levels is inherited as a Mendelian recessive trait and suggest that the basis for low blood levels is inherited as a Mendelian dominant trait.

The study, financed in part by the Utah Tuberculosis and Health Association's Research Fund for Pulmonary Disease, is expected to be useful both as an aid in treatment and as a contribution in the general field of human genetics, VA said.

VA TO HOLD CONFERENCE ON TRANQUILIZERS

Latest findings of a wide range of research on newer drugs for mental illness will be presented at the Veterans Administration's annual research conference on chemotherapy in psychiatry, May 20-22 at the VA hospital in Memphis, Tenn. The conference will include reports on the VA's large-scale cooperative study of four newer tranquilizing drugs—prochlorperazine, trifluorpromazine, perphenazine, and mepazine compared to chlorpromazine—which has been under way in 35 hospitals for about a year.

Papers also will be given on individual research by VA investigators, and plans will be made for new VA cooperative studies.

PANTOTHENATE NOT SUPERIOR IN STREPTOMYCIN STUDY

A newer form of streptomycin is not superior to an older form of the drug in treatment of tuberculosis, research results announced by Veterans Administration indicate. VA said a study of 237 tuberculosis patients in 13 of the agency's hospitals shows no evidence that use of streptomycin pantothenate rather than streptomycin sulfate reduces hearing impairment and other undesirable effects of streptomycin treatment to any significant extent.

Many reports in the medical literature in recent years had led to the hope that the pantothenate form of the drug might produce fewer and less severe undesirable effects than does the sulfate form of streptomycin, VA said.

The VA study, undertaken to follow up these reports by large-scale controlled research, was part of a continuing series of VA-Armed Forces cooperative studies of the chemotherapy of tuberculosis that was begun in 1946.

DR. BARNWELL CITED

The Veterans Administration's top award, the Exceptional Service Award, has been presented to Dr. John B. Barnwell, the agency's chief of medical research and education, by Administrator of Veterans Affairs Sumner G. Whittier. Dr. Barnwell was cited for his part in organization of the VA-Armed Forces cooperative study of the chemotherapy of tuberculosis, and for his leadership as VA assistant chief medical director for research and education.

The VA-Armed Forces study, begun under Dr. Barnwell when he was chief of the VA tuberculosis service in 1946, and still continuing under that service, has played a large part in giving medicine modern drug treatments for TB. The project is the pioneer cooperative study in VA's medical research program, which now includes 21 cooperative studies and some 5,900 individual studies.

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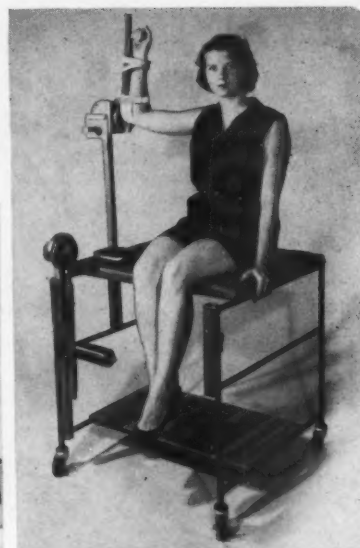
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